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Project Number G00864

Mr. Brian Helland, RPM
BRAC PMO, Northeast
4911 South Broad Street
Philadelphia, Pennsylvania 19112

Reference: CLEAN Contract No. N62467-04-D-0055
Contract Task Order (CTO) No. 407

Subject: Draft Five-Year Review Report
Naval Air Station South Weymouth, Weymouth, Massachusetts

Dear Mr. Helland:

Tetra Tech NUS, Inc. (TtNUS) has prepared a Draft Five-Year Review Report, Naval Air Station South Weymouth, Weymouth, Massachusetts. This review has been prepared in accordance with Navy policy and U.S. Environmental Protection Agency (EPA) guidance. The triggering action for this first five-year review is the start of the remedial action at the Rubble Disposal Area (RDA). The document focuses on the RDA, which is the only CERCLA site with a remedy in place, and also includes summary information on all the other CERCLA sites at NAS South Weymouth.

Through copy of this letter, the Draft Five-Year Review Report is being provided to the recipients listed below. Any questions regarding the document should be directed to your attention at (215) 897-4912. Please contact me at (978) 474-8403 should you have any questions.

Very truly yours,

Phoebe A. Call

Phoebe A. Call
Project Manager

PAC/lh

Enclosures

c: D. Barney, Navy (w/encl. – 2 paper, 1 CD)
B. Capito, Navy (w/o encl.) (electronic)
K. Keckler, EPA (w/encl. – 2 paper, 2 CDs)
D. Chaffin, MassDEP (w/encl. – 2 paper, 1 CD)
P. Golonka, Gannett Fleming (w/encl. – 1 paper, 1 CD)
Y. Walker, Naval Environmental Health Center (w/encl. – 1 CD)
P. Sortin, Abington (w/encl. – 1 CD)
D. McCormack, Weymouth (w/encl. – 1 paper)
M. Parsons, Rockland (w/encl. – 1 CD)
Tufts Library, Weymouth (w/encl. – 1 CD)
Public Library, Abington (w/encl. – 1 CD)
Public Library, Rockland (w/encl. – 1 CD)
Public Library, Hingham (w/encl. – 1 CD)
Executive Director, South Shore Tri-town Development Corp. (w/encl. – 1 paper, 1 CD)
J. Trepanowski, TtNUS (w/encl. – 1 CD)
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File G00864-3.2 (w/o encl.); G00864-8.0 (w/encl. - 1 each

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FIVE-YEAR REVIEW REPORT

for

NAVAL AIR STATION SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511

Submitted by:
Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260
King of Prussia, Pennsylvania 19406

CONTRACT NUMBER N62467-04-D-0055
CONTRACT TASK ORDER 407

January 2009

PREPARED UNDER THE DIRECTION OF:

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ACRONYMS

ABTFSA	Abandoned Bladder Tank Fuel Storage Area
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
ATC	Air Traffic Control
AUL	Activity and Use Limitation
AVS	Acid Volatile Sulfides
BCT	BRAC Cleanup Team
B&R	Brown and Root
bgs	below ground surface
BRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
CBR	Critical body ratios
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Chemical of Concern
COPC	Contaminant of Potential Concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
CRAM	Closeout Report Action Memorandum
CTO	Contract Task Order
CV	Chronic values
DL	Detection Limit
DoD	Department of Defense
DSWM	Division of Solid Waste Management
EBS	Environmental Baseline Survey
EE/CA	Engineering Evaluation and Cost Analysis
EPA	United States Environmental Protection Agency
EPH	Extractable petroleum hydrocarbon
ERA	Ecological risk assessment
FFA	Federal Facility Agreement
FFTA	Fire Fighting Training Area
FS	Feasibility Study
HQ	Hazard quotient
H_2S	Hydrogen Sulfide
ISCO	In-situ chemical oxidation
IR	Installation Restoration
LNAPL	Light non-aqueous phase liquid
LTM	Long-term monitoring
LTMP	Long Term Monitoring Plan
LUC	Land use control
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MMCL	MassDEP Maximum Contaminant Level

ACRONYMS (Cont.)

MCP	Massachusetts Contingency Plan
MESA	Massachusetts Endangered Species Act
MNHA	Massachusetts Natural Heritage Atlas
msl	Mean sea level
NAVFAC	Naval Facilities Engineering Command
NEX	Naval Exchange
NFA	No Further Action
NAS	Naval Air Station
NCP	National Contingency Plan
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
O&M	Operations and Maintenance
OMEE LEL	Ontario Ministry of Environmental and Energy Lowest Effects Level
ORNL	Oak Ridge National Laboratory
OU	Operable Unit
OWS	Oil water separator
PA	Preliminary Assessment
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PMO	Program Management Office
QA/QC	Quality Assurance/Quality Control
RAB	Restoration Advisory Board
RAM	Release Abatement Measure
RAO	Response Action Outcome (MCP term)
RAO	Remedial Action Objective
RC	Reportable Concentration
RCRA	Resource Conservation and Recovery Act
RDA	Rubble Disposal Area
RG	Remedial Goal
RI	Remedial Investigation
RIA	Review Item Area
ROD	Record of Decision
SEM	Simultaneously Extracted Metals
SI	Site Inspection
SL	Small Landfill
SSL	Soil screening levels
SSTTDC	South Shore Tri-Town Development Corporation
STP	Sewage Treatement Plant
SVOC	Semivolatile Organic Compound
TACAN	Tactical Air Navigation
TCRA	Time critical removal action
TEC	Threshold Effects Concentration
TLF	Tile Leach Field

ACRONYMS (Cont.)

TRV	Toxicity reference value
TtEC	Tetra Tech EC
TtNUS	Tetra Tech NUS
µg/L	Micrograms per liter
UXO	Unexploded ordnance
VPH	Volatile petroleum hydrocarbon
VOC	Volatile organic compound
WGL	West Gate Landfill
yd^3	cubic yards

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Naval Air Station South Weymouth		
EPA ID *(from WasteLAN)*: MA2170022022		
Region: 1 (EPA Region 1)	**State:** MA	**City/County:** Town of Weymouth/Norfolk County; Towns of Abington and Rockland/Plymouth County
SITE STATUS		
NPL status: Final		
Remediation status (choose all that apply): Operating		
Multiple OUs?* Yes	**Construction completion date:** December 2005 (date remedial construction activities completed at RDA)	
Has site been put into reuse? Portions of the Base transferred to SSTTDC are beginning to be redeveloped in accordance with the approved Reuse Plan.		
REVIEW STATUS		
Lead agency: U.S. Department of the Navy		
Author name: Tetra Tech NUS, Inc. under contract to the U.S. Navy		
Author title: Tetra Tech NUS, Inc.	**Author affiliation:** under contract to NAVFAC Mid Atlantic	
Review period: 11/01/08 to 7/13/09		
Date(s) of site inspection: 11/21/08		
Type of review: Post-SARA Policy Review		
Review number: 1 (first)		
Triggering action: Remedial Action Start Date for Rubble Disposal Area (OU 2 and 9)		
Triggering action date *(from WasteLAN)*: July 13, 2004		
Due date (five years after triggering action date): July 13, 2009		

* "OU" refers to operable unit.

Five-Year Review Summary Form, cont'd.

Issues (note: these issues pertain to the RDA since the remedy is in place and operating under the approved post-closure monitoring program):

- Background wells have low-yield and poor hydraulic conductivity conditions.
- Remedial Goals and MCL/MMCL criteria for manganese in groundwater have consistently been exceeded and NRWQC have been exceeded in surface water.
- Landfill gas monitoring field measurement has detected elevated levels of methane gas.
- Various O&M tasks need to be completed.
- Invasive species are present in restored/created wetlands.
- Land Use Control Implementation Plan needs to be finalized and implemented.

Recommendations and Follow-up Actions:

- Replace background monitoring wells RDA-TT01 and RDA-MW05.
- Continue to monitor concentration trends in groundwater and surface water.
- Perform landfill gas sampling, analyze using EPA Method TO15, and compare the analytical results to MassDEP threshold effects exposure limits. - Repair tire ruts, areas of erosion, and southern benchmark. Conduct landfill settlement survey.
- Research control of purple loosestrife using beetles. Use glyphosate on common reed and remove crown and stem of glossy buckthorn.
- Ensure implementation of land use controls upon transfer of property to land developer.

Protectiveness Statement(s):

The remedy for the RDA is expected to be protective of human health and the environment upon completion of long-term monitoring, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Long-term monitoring is being conducted in accordance with the approved LTMP and QAPP. Contaminant concentrations are consistently below RG levels for two of the three designated contaminants. Benzo(a)pyrene concentrations have been below RG levels since Round 2-2007 and arsenic concentrations since Round 5-2008. Manganese concentrations have been above RG levels in nine of the ten monitoring wells in all LTM events to date.

Land use controls must be put in place and implemented upon transfer of the property. Continuation of post-closure inspections and maintenance/repairs for the landfill area cap are required to ensure the remedy remains protective. Long-term monitoring must continue consistent with the EPA and MassDEP approved Final Long-Term Monitoring Plan (TtEC, 2008) and the Final Quality Assurance Project Plan for Long-Term Monitoring (TtNUS, 2007) and approved modifications. Long-term monitoring data must be evaluated annually to ensure the remedy remains protective of human health and the environment.

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1.0 INTRODUCTION

This Five-Year Review of the former Naval Air Station (NAS) South Weymouth, Weymouth, Massachusetts was prepared for the U.S. Navy (Navy) by Tetra Tech NUS, Inc. (TtNUS) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62467-04-D-0055, Contract Task Order (CTO) 407. This document is the first five-year review conducted for NAS South Weymouth (the Base). While the focus on this five-year review is on the Rubble Disposal Area (RDA), which is the only Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site where a remedial action has been implemented thus triggering this five-year review, this document includes summary information on all the CERCLA sites at the Base.

1.1 PURPOSE

The purpose of a five-year review is to determine if the remedy selected for and implemented at a site(s) is protective of human health and the environment. This report summarizes the five-year review process, investigations and remedial actions undertaken at the RDA and other CERCLA sites located at the NAS South Weymouth; evaluates the RDA monitoring data collected; reviews, as appropriate, the Applicable or Relevant and Appropriate Requirements (ARARs) specified in the RDA Feasibility Study (FS), RDA Record of Decision (ROD), and other relevant documents for changes; discusses any issues identified during the review; and presents recommendations to address those issues.

The Navy must implement five-year reviews consistent with the CERCLA §121 and the National Contingency Plan. CERCLA §121 states:

> "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

The National Contingency Plan 40 CFR §300.430(f) (4) (ii) states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

Although this five year review report focuses on the RDA, it also provides information on the other active and completed CERCLA sites located at NAS South Weymouth. These CERCLA sites are being managed under either the Navy's Installation Restoration (IR) Program or as CERCLA Areas of Concern (AOCs).

The lead regulatory agency for the NAS South Weymouth and the RDA is the U. S. Environmental Protection Agency (EPA). EPA placed NAS South Weymouth on the National Priority List (NPL) in 1994. The Massachusetts Department of Environmental Protection (MassDEP) participates in reviews of all environmental documents and offers concurrence on the remedy selected in the ROD for each CERCLA site.

This statutory five-year review is required since hazardous contamination remains at the RDA above levels that allow for unlimited use and unrestricted exposure. The triggering action for this first five-year review was initiation of the remedial actions at RDA in July 2004. The review was completed in accordance with EPA guidance, *Comprehensive Five-Year Review Guidance*, OSWER No. 9355.7-03B-P (EPA, 2001) and the Navy *Policy for Conducting Five-Year Reviews Under the Installation Restoration Program* (Navy, 2004).

1.2 BACKGROUND

NAS South Weymouth was administratively closed September 30, 1997 under the Defense Base Realignment and Closure (BRAC), Public Law 101-510, as part of the BRAC Commission's 1995 Base Closure List (BRAC IV). Operational closure of the NAS South Weymouth airfield (through transfer of aircraft to other Navy facilities and personnel reduction) was completed on September 30, 1996.

As a result of the operational closure, the facility was placed in caretaker status under the supervision of Naval Facilities Engineering Command (NAVFAC), Northern Division. The facility is now under the supervision of BRAC Program Management Office (PMO) Northeast, Philadelphia, Pennsylvania.

1.2.1 Installation Description

NAS South Weymouth is located approximately 15 miles southeast of Boston, Massachusetts, in Norfolk and Plymouth counties in the Towns of Weymouth, Abington, and Rockland. The Base encompasses approximately 1,444 acres. The facility is located in an urban area and is partially developed. Wetlands and forested areas remain. The topography is relatively flat and characterized by bedrock outcrops, wetland areas, and small stream channels. The topography has been altered and regraded throughout its operational history by the Navy during construction of the runways, taxiways, and related facilities.

As a closed base under the BRAC program, portions of the Navy property are undergoing redevelopment. Approximately 549 acres have been transferred by the Navy to the local redevelopment authority, South Shore Tri-Town Development Corporation (SSTTDC). The Navy has completed investigation and any required removal actions at another 673 acres, which the Navy plans to transfer to SSTTDC in 2009. Completed CERCLA sites included in the acreage pending transfer are discussed in Section 3 of this report. The remaining base acreage includes active sites that are under investigation and for which remedies have not yet been selected. The active CERCLA sites are discussed in Section 3.

1.2.2 Installation History

NAS South Weymouth originated with the Naval Expansion Act of 1940, which authorized construction of 48 non-rigid airships (blimps) to be used for coastal anti-submarine patrols. NAS South Weymouth was commissioned on March 1, 1942. The immediate strategic need for NAS South Weymouth disappeared with the end of World War II. On August 8, 1945, the station was reduced to the status of a naval aviation facility and designated as an aircraft storage site. In June 1949, the station was deactivated and remained idle until early 1951. In 1951, Congress appropriated over $5 million for the construction of runways, hangars, buildings, fuel storage areas, and other facilities at the station. In July 1953, a naval air development unit moved to the station. This unit developed and tested anti-submarine and air defense equipment.

In December 1953, the station regained its status as a Naval Air Station when training facilities from Squantum NAS (Quincy, MA) were transferred to South Weymouth. In 1954, NAS South Weymouth became the home base for the blimps of Airship Early Warning Squadron One. The Navy withdrew blimps from active service in 1961, and NAS South Weymouth became solely a Naval Air Reserve facility. The buildings and structures that had supported the airship operations were demolished during the mid-1960s and replaced with facilities designed to accommodate fixed-wing aircraft.

In September 1996, when operational closure of the airfield under BRAC occurred, the aircraft were moved to Brunswick NAS in Maine. Between 1996 and 1997, NAS South Weymouth provided facilities, ground training, and limited surface training to Marine and Naval reserve units. Administrative closure was completed in September 1997.

1.2.3 Installation Restoration Program History

In March 1988, the Navy conducted a Preliminary Assessment (PA) under the IR Program. The PA consisted of a records search, site visit, and interviews with facility personnel. The PA report prepared by Argonne National Laboratory identified five potential hazardous waste sites based on past practices:

Site 1, the West Gate Landfill (WGL); Site 2, the RDA; Site 3, the Small Landfill (SL); Site 4, the Former Fire Training Area (FFTA); and Site 5, the Tile Leach Field (TLF).

The Navy completed a Site Inspection (SI), prepared by Baker Environmental, Inc., in December 1991. The SI investigated the five potential sites identified in the PA, as well as three additional sites the Navy added to the program: Site 6, the Fuel Farm; Site 7, the former Sewage Treatment Plant (STP); and Site 8, the Abandoned Bladder Tank Fuel Storage Area (ABTFSA). The SI included site walkovers; geophysical surveys; installation of monitoring wells; and analysis of soil, sediment, surface water, and groundwater samples.

The SI report identified no imminent hazards to human health or the environment due to the sites. It recommended No Further Action (NFA) for Sites 5 and 7, and that Remedial Investigation/Feasibility Studies (RI/FS) be conducted for Sites 1, 2, 3, 4, 6, and 8. In response to concerns from EPA and the MassDEP, the Navy proposed to conduct a Supplemental SI for Sites 5 and 7 during the completion of the RI. Subsequently, the Navy, EPA, and the MassDEP agreed that Site 6, the Fuel Farm, could best be addressed in a manner consistent with the Massachusetts Contingency Plan (MCP) and, as such, it was not included in the RI.

The Navy conducted the field investigation for the Phase I RI from December 1995 through June 1996. As described above, seven of the eight sites identified in the PA and SI were included in this RI. The investigation included collection and analysis of surface water, groundwater, soil, and sediment; assessment of the nature and extent of contamination; an evaluation of the fate and transport of the constituents of concern; and the assessment of risk to human and ecological receptors.

The Phase I Draft RI was submitted in November 1996 and was subsequently finalized in July 1998 following extensive reviews and comments by the EPA, MassDEP, and the community. The Navy, EPA, and MassDEP agreed that the Navy would conduct a Phase II RI to further characterize the sites and complete human health and ecological risk assessments. Since that time, the Navy added three more sites to the IR Program: Site 9 – Building 81; Site 10 – Building 82; and Site 11 – Solvent Release Area (SRA).

In accordance with the Federal Facilities Agreement (FFA), the BRAC Cleanup Team (BCT) currently has identified 11 Operable Units (OUs) to manage the CERCLA RI/FS and Remedial Design/Remedial Action (RD/RA) process (as necessary) at the 10 IR Program sites. The RDA was divided into two OUs based on geographic location and media of concern: RDA Upland (OU-2) to address soil; and RDA Wetland (OU-9) to address surface water and sediment. Former Site 6 (OU-6), the former Fuel Farm, was transferred out of the IR Program and was addressed as a petroleum site under the UST program and in

a manner consistent with the MCP. Thus, there is presently no OU-6 or Site 6. The current sites, with their BCT-designated OU numbers, are listed below:

- Site 1, WGL – OU-1
- Site 2, RDA Upland – OU-2
- Site 2, RDA Wetland – OU-9
- Site 3, SL – OU-3
- Site 4, FFTA – OU-4
- Site 5, TLF – OU-5
- Site 7, STP – OU-7
- Site 8, ABTFSA – OU-8
- Site 9, Building 81 – OU-10
- Site 10, Building 82 – OU-11
- Site 11, Solvent Release Area – OU-12

1.3 PUBLIC NOTIFICATION AND INTERVIEWS

The Navy initiated the five-year review for NAS South Weymouth with a notice published in the Weymouth News, Rockland Mariner/Standard, and Patriot Ledger the week of October 20, 2008. The five-year review process was presented and interview questionnaires were distributed at a Restoration Advisory Board (RAB) public meeting on November 13, 2008. The findings of this five-year review will be presented at another RAB meeting in the Spring of 2009.

Tetra Tech personnel visited the town halls in Weymouth, Rockland, and Abington. At the Town of Weymouth, sample interview question forms were distributed to administrative assistants for the Mayor, Town Council, and Health Department. Interviews were conducted with the Town Clerk and the Conservation Administrator. Zoning maps were reviewed at the Planning Division.

At the Town of Rockland and Abington, interview questionnaires were distributed to the administrative assistants for the Town Administrator (Rockland), Town Manager (Abington), Board of Selectmen (Rockland), Town Selectmen (Abington), and Board of Health (Rockland and Abington). The Town Clerk (Rockland and Abington) was interviewed and zoning maps were reviewed at the Building Department.

In addition, Tetra Tech personnel visited the Tufts Library (Weymouth), Memorial Library (Rockland), Abington Library, and Hingham Library to review the NAS South Weymouth information repositories.

1.4 REPORT ORGANIZATION

This report has been organized to address the various components and general format requirements specified in the Comprehensive Five-Year Review Guidance, OSWER No. 9355.7-03B-P (EPA, 2001). Section 1 presents the purpose of the five-year review and provides NAS South Weymouth background information, history, and described the public notification process. Section 2 provides information in accordance with EPA guidance for the Rubble Disposal Area. Section 3 provides a brief summary of the history, investigations performed, and current activities underway at each of the active and completed IR Sites and CERCLA AOCs at the Base that are included in the FFA. The following appendices are included in the report. Appendix A is a list of documents reviewed and referenced in this report; Appendix B, C, and D includes RDA-specified data; Appendix E includes a site inspection summary with photographs; Appendix F is a list of individuals interviewed; Appendix G is a copy of the public notice; Appendix H includes a summary of ARARs applicable to the RDA.

2

2.0 IR PROGRAM SITE 2 – RUBBLE DISPOSAL AREA

This section presents the findings of the five-year review for the remedy that was implemented at the RDA site. The format of this section follows in the format of the EPA Comprehensive Five-Year Review Guidance (June 2001).

2.1 SITE CHRONOLOGY

A site chronology is included in the following table:

Table 2-1
Chronology of Site Events

Event	Date
NAS South Weymouth is commissioned	March 1, 1942
Rubble Disposal Area (RDA) is used for the disposal of large natural debris	1959 – 1962
Building debris from Building 21, destroyed by a fire, is placed in the RDA	1978
Installation Restoration (IR) Program initiated by the Department of Defense	1983
Preliminary Assessment performed by Argonne National Laboratory	March 1988
Site Inspection (SI) completed by Baker Environmental, Inc.	December 1991
NAS South Weymouth is placed on the National Priorities List (NPL)	May 1994
Phase I Remedial Investigation (RI) conducted by Brown & Root Environmental	1995 - 1996
NAS South Weymouth designated for closure under BRAC IV	1995
NAS South Weymouth operationally closed	September 30, 1996
NAS South Weymouth administratively closed	September 30, 1997
RDA Phase I Remedial Investigation (RI) Study completed by Brown & Root Environmental and ENSR	1998
Federal Facility Agreement (FFA) executed by the Navy and EPA	April 2000
Additional assessment of PCBs in the northeastern portion of the RDA	2000
RDA Phase II RI completed by Tetra Tech NUS and ENSR	January 2001
Feasibility Study (FS) completed by Tetra Tech NUS and ENSR	March 2002
Rare Turtle Oversight Monitoring Program	April 2003 – November 2004
Pre-Design Investigation completed	June 2003
Final Design Analysis Report	July 2003

Record of Decision (ROD) signed	December 2003
Remedial construction activities, installation of landfill soil cap	April 8, 2004 – December 2, 2005
Removal of PCB impacted material from adjacent wetland area completed	June 9, 2004
Removal of PCB impacted material from upland area completed	August 12, 2004
Wetland restoration activities conducted	September 15 – October 22, 2004
Final inspection of original construction performed with USEPA, MassDEP, and the Navy	October 28, 2004
Final inspection of PCB hotspot cap construction performed with USEPA, MassDEP, and the Navy	December 8, 2005
Draft Final Land Use Control Remedial Design/Implementation Plan completed by Tetra Tech NUS	March 2007
Operations and Maintenance (O&M) activities (facility inspections)	On-going
Long-term monitoring (LTM) First Round, 2007 conducted	March 2007
LTM Second Round, 2007 conducted	June 2007
LTM Third Round, 2007 conducted	September 2007
Fall 2007 Post-Remediation Wetland Inspection	November 2007
LTM Fourth Round, 2007 conducted	December 2007
LTM First Round, 2008 conducted	April 2008
Spring 2008 Post-Remediation Wetland Inspection	June 2008
LTM Second Round, 2008 conducted	June 2008
LTM Third Round, 2008 conducted	September 2008
Fall 2008 Post-Remediation Wetland Inspection	November 2008
Small Mammal Sampling Event conducted	November 2008
LTM Fourth Round, 2008 conducted	December 2008
First Five-Year Review completed	July 2009

2.2 BACKGROUND

This section contains information on the RDA's physical characteristics, land and resource use, history of contamination, initial response, and basis for taking action.

2.2.1 Physical Characteristics

The RDA is a closed landfill covering approximately 4 acres in the northeastern portion of the NAS South Weymouth property, east of Runway 8-26 (Figure 2-1). Roads and trails are located to the north and west of the Site and forested uplands are located south of the Site. The RDA is bounded to the east by palustrine wetlands that border Old Swamp River. The river flows to the north and passes through four 10-foot wide corrugated metal conduits located beneath an access road at the north end of the landfill. A small intermittent stream, known as the Feeder Stream or the southern Downgradient Water Course, forms the south-southwestern boundary of the RDA. This stream enters the palustrine wetland and flows north along the Site prior to discharging into Old Swamp River. The distance from the former disposal area at the RDA to Old Swamp River ranges from approximately 300 feet (southern portion of disposal area) to approximately 50 feet (northern portion of disposal area) (TtNUS, 2007) (Figure 2-1).

Topographically, the RDA is relatively flat. The majority of the debris was located in the flatter upland area of the RDA. Before the RDA was capped, some debris was observed along the eastern, downslope edges of the former disposal area, which was likely deposited there through erosion from the upland area. Much of the RDA uplands are open and grassy. Palustrine wetlands are located at the toe of the slope of the upland area, between the filled uplands and Old Swamp River, and surrounding the Feeder Stream.

The RDA is covered by a vegetated soil cap. A locked, metal swing gate is located at the landfill entrance to the west. A 3.5 foot high wooden post and rail fence and storm water controls consisting of drainage swales and slope protection rip-rap enclose the landfill. Ten groundwater monitoring wells, seven piezometers, and six staff gauges are located on the site. In addition, a passive landfill gas monitoring system consisting of eight gas vent pipes and seven gas probes are located on the Site.

According to the Phase II Remedial Investigation (RI) report (TtNUS, 2001), the geology is relatively consistent throughout the Site, with fill material overlying glacial and post-glacial deposits. The fill material is underlain by varying quantities of shallow sediments, organic peat, fluvial sand and gravel, lacustrine delta/beach deposits, and glacial till. TtNUS observed similar materials beneath the Site during installation of groundwater monitoring wells in 2007 as part of the long-term monitoring activities. The bedrock elevation varies from greater than 120 feet at the western boundary of the RDA to less than 105 feet to the east. The bedrock topographic surface slopes from west to east.

2.2.2 Land and Resource Use

NAS South Weymouth was operationally closed on September 30, 1996, and administratively closed on September 30, 1997. The Base is located within a residential/light commercial area. The RDA has not been active since 1978. In addition, the area adjacent to the RDA has not been used for any operational purposes since closure of the Base (U.S. Navy, 2003).

Discussions regarding future land use plans for the site were still ongoing at the time the ROD was signed (December 2003). At that time, the proposed future use of the RDA was open space. A small portion of the RDA to the north had been proposed for commercial business or industrial use. Currently, the majority of the RDA is zoned for Open Space – Rockland District (OS-R) with a small northern portion zoned as Mixed-Use Village District (MUVD). According to the Zoning and Land Use By-Laws for NAS South Weymouth (SSTTDC, 2005), this open space is intended for park land, active and passive recreation, reservations, community gardens, rivers and streams, and similar uses. The redevelopment plans include construction of the East-West Parkway directly north of the RDA.

According to the Phase II RI (TtNUS, 2001), the spotted turtle (*Clemmys guttata)* and the eastern box turtle *(Terrapene carolina)* are present at and in the vicinity of the RDA. At that time, both species were state-listed and afforded protection under the Massachusetts Wetlands Protection Act (M.G.L. c. 131, s.40) and the Massachusetts Endangered Species Act (M.G.L. c. 131A) as Species of Special Concern. The spotted turtle was removed from the state list in May 2006. The eastern box turtle is not a federally threatened or endangered species.

2.2.3 History of Contamination

The RDA was used for 4 years between 1959 and 1962, and again for a short period in 1978. Between 1959 and 1962, the RDA was used for the disposal of large natural debris, such as boulders and tree stumps, that were unsuitable as base-material for construction of the nearby Old Swamp River bridge. In 1978, building debris from Building 21, which was destroyed by fire, was placed in the RDA. In addition to these two uses of the site, there have been unofficial reports that transformers, transformer components, or transformer fluids were disposed of at the RDA. Materials observed at the site during environmental investigations included glass, insulation material, concrete, scrap metal, wire, asphalt, rubber, fabric, boulders, and wood. Arresting gear strapping and metal drum fragments have also been observed at the Site. There are no records of hazardous wastes, regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA), being disposed of at the RDA (U.S. Navy, 2003).

2.2.4 Initial Response

The Navy has been conducting environmental investigations at the NAS South Weymouth property since 1988 through its Installation Restoration (IR) Program (Brown & Root (B&R) Environmental, 1998). A Preliminary Assessment (PA), including a records search, interviews, and a site walkover, was performed by Argonne National Laboratory in 1988. Due to the findings of the PA, Baker Environmental, Inc. conducted a Site Inspection (SI) of eight sites, including the RDA, which was completed in 1991. This investigation included site walkovers, geophysical surveys, installation of groundwater monitoring wells, and the collection of soil, sediment, surface water, and groundwater samples. The SI recommended that the RDA be further studied under the IR program as part of an RI.

The Phase I RI was completed by B&R Environmental, now Tetra Tech, in 1996. The Phase I program included a literature search; geophysical and soil vapor surveys; immunoassay testing; ecological assessment; test pit excavation; monitoring well, well point, and piezometer installation; hydraulic conductivity testing; groundwater gauging and water level measurements; stream gauging; and surface soil, subsurface soil, groundwater, sediment, surface water, and leachate sampling. Additional investigation was deemed necessary following completion of the Phase I RI, so a Phase II RI was conducted in 2001. Ecological assessment, groundwater gauging, water level measurements, and surface soil sampling were all used to fill identified data gaps and verify the absence of hazardous substances within the landfill. In 2002, the Navy prepared an FS to identify the remedial action objectives for the Site, and to identify and evaluate cleanup alternatives to achieve the objectives (U.S. Navy, 2003).

Following the EPA listing of the Base on the National Priorities List (NPL) in 1994, a Federal Facility Agreement (FFA) was executed between the Navy and EPA. The FFA became effective in April 2000. This agreement established the Navy as the lead agency for the investigation and cleanup of designated sites within the NAS South Weymouth property, with EPA providing oversight. The MassDEP is not a party to the FFA. In accordance with CERCLA and the NCP, MassDEP has participated in ongoing discussions and strategy sessions, and has provided oversight and guidance through their review of IR Program documents (U.S. Navy, 2003).

2.2.5 Basis for Taking Action

The RI/FS characterized the nature and extent of contamination at the RDA, assessed potential risks posed by these conditions, and recommended a remedial closure approach. The size of the landfill area was investigated, and groundwater, surface water, sediment, and small mammal tissue samples were collected during a several sampling events. In addition, a human health risk assessment and an ecological risk assessment were conducted. The results of the RI are summarized below.

2.2.5.1 Landfill Area

The area of the former disposal area, designated by the extent of waste material, is approximately 3.83 acres (167,000 square feet). The approximate volume of waste material within the disposal area is 50,000 cubic yards (TtNUS, 2001).

2.2.5.2 Historic Sampling

In 1990, 1996, and 1999, samples of several media were collected and analyzed to characterize the RDA. Media sampled during these environmental studies included surface soil, subsurface soil, groundwater, surface water, and sediment (hydric soil and river sediment). In addition, terrestrial (upland) and aquatic (wetland and river) tissue samples were also collected from a variety of animals and organisms. Chemical parameters analyzed included all of the organic compounds (volatile, semivolatile, pesticides, and PCBs) on EPA's target compound list (TCL), as well as all of the EPA's target analyte list (TAL inorganics). In addition, samples collected in 1996 were analyzed for potential hazardous waste properties (to aid in understanding the regulatory context of the site); samples collected in 1999 were analyzed for dioxins.

For the most part, the concentrations of chemicals detected at the RDA were very close to sample quantitation limits (SQLs) reported by laboratories. With the exception of a few constituents, chemicals at concentrations above the SQLs were either: (1) consistent with background conditions (such as the occurrence of metals); or (2) consistent with expected residue from site activities (such as the base-wide application of pesticides). A limited area (54 cubic yards) of PCB-impacted soil was identified in hydric soils within previous wetland areas of the RDA, near the toe of the slope at the northeastern edge of the former disposal area. In addition, four chemicals, arsenic, lead, manganese, and benzo(a)pyrene, were detected in groundwater at concentrations greater than background conditions.

The RI indicated that groundwater flows towards the east towards Old Swamp River and that flow in bedrock was assumed to be similar. A downward gradient from overburden into the bedrock was also suggested by groundwater elevation data in bedrock and overburden wells in close proximity to each other.

2.2.5.3 Risk Assessment

Human Health Risk Assessment

The human health risk assessment (HHRA) followed EPA's required four-step process. Twenty of the chemicals detected at the RDA were selected for evaluation in the human health risk assessment as chemicals of potential concern.

The risk assessment determined that potential carcinogenic and non-carcinogenic risks under the current use scenario were within or below the acceptable risk benchmarks at the RDA. However, potential risks under the future scenario were above acceptable carcinogenic and non-carcinogenic risk benchmarks for the residential receptor. These theoretical exceedances were based on the potential exposure to arsenic, benzo(a)pyrene, and manganese in groundwater used as drinking water (U.S. Navy, 2003).

Ecological Risk Assessment

The ecological risk assessment (ERA) evaluated potential risks to ecological receptors that may occur due to the presence of chemical stressors in environmental media. The ERA was completed in three steps: (1) problem formulation; (2) risk analysis; and (3) risk characterization. The ecological receptor groups evaluated included vertebrate wildlife, aquatic invertebrates, aquatic and wetland vertebrates, terrestrial invertebrates, and terrestrial plants.

The ERA did not identify adverse effects to receptors based on exposure to surface soil, sediment, surface water, or wetland plants and aquatic animal tissue. However, the presence of PCBs in hydric soil and small mammal tissue suggested potential risk to small mammals. The ERA concluded that, although the presence of PCBs in hydric soil and lower trophic-level animals (mice, fish, amphibians, and earthworms) presents potential risks to small mammals, it does not impact the food chain, and does not exceed regulatory risk thresholds for higher trophic-level birds and mammals.

2.2.5.4 Feasibility Study

Based on the risks identified in the RI, an FS was completed in March 2002. The FS established remedial action objectives (RAOs) which are media-specific goals based on the chemicals of concern, exposure pathways, and receptors at the Site. The RAOs also were established to ensure compliance with the ARARs included in the FS. The FS identified seven remedial alternatives and evaluated each one based on its implementability, effectiveness, and cost. Each alternative was further evaluated based on the nine FS criteria grouped into threshold criteria, primary balancing criteria and modifying criteria.

2.3 REMEDIAL ACTION

In the February 2003 Proposed Plan for the RDA the Navy proposed alternative RDA-5, remove soil and sediment containing PCBs, dispose off-site and construct a soil cover over the site. The Proposed Plan was available for public review and comment from February 24, 2003 through April 10, 2003 and presented to the public on February 27, 2003. The Navy considered all comments received and documented the selected remedy in the ROD.

2.3.1 Remedy Selection

The ROD for the Rubble Disposal Area was signed by U.S. Navy and EPA in December 2003, with MassDEP concurrence. The RAOs established during the FS (first three bullets) and modified in the Proposed Plan (fourth bullet) based on discussions with the EPA and MassDEP are:

- Minimize erosion and deposition of waste materials into the adjacent wetlands.
- Eliminate or minimize the potential for small mammals to be exposed to PCBs present in hydric soil in the adjacent wetlands.
- If capping is being considered, comply with Massachusetts solid waste landfill closure and post-closure requirements.
- Prevent human exposure to groundwater containing contaminant concentrations in excess of federal or more stringent state drinking water standards or posing potential risks to humans.

The remedy selected to meet these RAOs included the following elements: excavation and offsite disposal of PCB material, a permeable soil cap for disposed material, long-term monitoring (LTM), and institutional controls. As stated in the ROD, the major components of the selected remedy included the following:

- Conducting, as necessary, further data evaluation or collection to support the design of the soil cover (e.g., compaction and related testing);
- Excavating PCB-impacted material from the adjacent wetland area, and disposing of the material in an offsite landfill;
- Conducting confirmatory PCB sampling and analysis within the excavated wetland area, as well as the immediately abutting upland soil, as part of the remedial action process prior to landfill capping;
- Removing physical debris from the wetland area for either placement on the upland portion of the disposal area or for offsite disposal;

- Restoring the wetland area that was disturbed during the removal of the PCB-impacted material and debris;
- Clearing, grubbing, and grading the site;
- Constructing a soil cover on the site in accordance with Massachusetts Solid Waste Landfill Closure requirements;
- Constructing a fence around the site and posting warning signs (note: this component was optional, to be implemented if consistent with future site use plans);
- Institutional controls to achieve the land use control performance objectives;
- Conducting long-term monitoring and site maintenance; and
- Conducting a review of the site every 5 years.

2.3.2 Remedy Implementation

The components of the remedy as implemented are documented in the *Final Remedial Action Completion Report for Rubble Disposal Area at Naval Air Station South Weymouth* completed by Tetra Tech EC, Inc. (2007) and summarized below. The report provides an exhaustive list of modifications to the original remedial design and a detailed explanation of the construction process.

TtEC mobilized to the RDA in April 2004. Site preparation activities included: utility mark out, identification of state-listed species of special concern, turtle survey, site survey, clearing and grubbing, removal of approach lights and other structures, construction of a truck tire cleaning pad and construction entrance, road improvements, erosion control installation, monitoring well abandonment and modifications, and implementation of site security measures (TtEC, 2007).

Landfill Cap Construction

A 4-acre landfill cap was constructed over the RDA. The cover system for the majority of the landfill was constructed by TtEC from May to October 2004[1]. According to the *Final Remedial Action Completion Report* (TtEC, 2007), this soil cover included the following components, listed in ascending order:

- In-situ material
- Common borrow layer
- 6-inch gas management layer
- 16-ounce non-woven geotextile (animal intrusion layer)
- 18-inch select fill layer

[1] The landfill cap over the PCB excavation area was constructed in November and December of 2005 (see Section 2.3.2.2).

- Hydroseeding
- Erosion control blanket
- *Slope protection riprap*

Each component of the landfill cap was tested and inspected prior to use in construction. Landfill material was relocated using conventional cut and fill methods to create the desired grade. Debris from outside the limits of the cap was incorporated into the landfill. The subgrade was proof rolled to ensure uniform compaction. Landfill restoration included hydroseeding and the placement of erosion control matting (TtEC, 2007).

Eight gas vents and seven gas probes were installed over the surface of the landfill and outside the landfill cap, respectively. Locked gates and concrete pads were installed around each gas vent. Of the nine existing monitoring wells, six were abandoned and two were modified. The casings for RDA-MW50D and -50D2 were extended (TtEC, 2007).

Stormwater Drainage Systems

A northern drainage swale was constructed between the existing access road to the north and the edge of the landfill cap. The V-shaped channel was designed for a 100-year flood. A series of gabion baskets were installed outside the cap limits at the southern portion of the landfill for slope stabilization. In addition, a stormwater swale along the west-southwest boundary of the landfill and slope protection rip rap were installed along the boundary of the wetland (eastern) side of the cap.

Turtle Bridges

Three species protected under the Massachusetts Endangered Species Act (MESA) were observed in the vicinity of or suspected to inhabit the RDA and surrounding areas: the northern harrier, a threatened species; and the eastern box turtle and spotted turtle, both species of special concern. To protect these species of special concern, turtle surveys were conducted prior to the commencement of site activities and periodically throughout the construction period. Nine soil turtle bridge crossings were constructed to provide eastern box turtles and spotted turtles access between the upland and wetland portions of their habitat. In addition, a ¾-inch layer of crushed stone was placed over the perimeter riprap to assist turtle crossings (TtEC, 2007).

PCB Area Excavation Activities

The landfill cap construction and PCB removal activities occurred concurrently. A PCB hotspot was located at the toe of the slope on the northwestern edge of the RDA. The hotspot included both upland and wetland areas. The PCB cleanup goal stated in the ROD was 8 ppm for upland soils and a post-excavation average of no more than 1 ppm in hydric soils. Initial exploratory sampling was conducted in June 2004 in the vicinity of this hotspot to fully delineate the extent of the contamination. Excavation of the PCB hotspot located in the wetlands occurred in June 2004. Nearby upland soils were excavated in August 2004. Confirmatory samples were collected from the sidewalls and base of each of the two excavations. Additional exploratory sampling was conducted in October 2004 to further delineate the extent of PCB contamination. This additional sampling was deemed necessary because the excavation was flooded during confirmatory sampling, possibly causing the excavation base samples to be biased high. Further excavation of upland and wetland soils was conducted in November 2005 based on the additional exploratory sampling results. A total of approximately 230 tons of upland and hydric soils were removed during the three PCB excavations (TtEC, 2007).

Due to the PCB excavation activities, approximately 5,500 square feet was not capped during the initial mobilization. This area was later capped in November and December 2005. Clay material similar to that used for the rest of the landfill was not available when the PCB area was being capped, so a geosynthetic liner was used instead of a low permeable select fill layer. The PCB area cap consisted of a 6-inch crushed gravel gas management layer, a geosynthetic liner, a 3-inch crushed gravel drainage layer, geotextile, 15 inches of compacted common fill, and a 6-inch layer of topsoil (TtEC, 2007).

Wetland Restoration Activities

Wetland restoration activities were conducted in September and October 2004. A total of 0.60 acres of palustrine scrub shrub and forested wetlands were temporarily or permanently impacted by the remedial activities. Following construction, 0.22 acres of wetland were restored and an additional 0.50 acres of emergent wetland were created. Overall, there was a net gain in wetlands at the RDA. Restoration and creation of wetlands required grading, topsoil formulation, herbaceous cover establishment, and monitoring (TtEC, 2007).

Institutional Controls

The ROD directed that the Navy implement institutional controls which will achieve the following land use control performance objectives:

- Prevent human exposure to groundwater containing contaminant concentrations in excess of federal or more stringent drinking water standards or posing potential risks to humans.
- Prohibit activities or uses of the site that would disturb or otherwise interfere with the integrity or function of the permeable soil cap. These prohibited activities include construction on, excavation of, or breaching of the permeable soil cap.

The purpose of these institutional controls is to control or restrict certain kinds of property uses to prevent potential exposure to hazardous substances. Final revisions to the land use control remedial design and implementation plan containing land use control implementation and maintenance actions (a "LUC Remedial Design") are currently in progress.

2.3.3 Operations and Maintenance

Landfill inspections have been conducted quarterly for the first 2 years in accordance with the *Final Long Term Monitoring Plan (LTMP) for Rubble Disposal Area, Operable Units 2 and 9 at Former Naval Air Station South Weymouth* (TtEC, 2007). The first inspection was conducted on October 24, 2006 by TtEC. Subsequent inspections have been conducted by TtEC in January, May and August 2007, and by TtNUS in November 2007 and March, June, and November 2008.

The primary activities associated with operations and maintenance (O&M) of the landfill include:

- Monitoring and inspection of the landfill cap quarterly for the first 2 years of the post-closure care period and semiannually thereafter (early spring and late fall).
- Visual inspection of the landfill cap with regard to vegetative cover, settlement, erosion, evidence of burrowing animals, and need for corrective action.
- Inspection of the access road, security fence, gate, and signage.
- Visual inspection of the eastern margin of the landfill to monitor the areas of leachate breakout, oil seepage, and iron-staining flocculent.
- Inspection and maintenance of the stormwater drainage system including the four 10-foot diameter culverts in the Old Swamp River, the drainage swale along the northern landfill boundary, and the slope protection rip rap along the eastern boundary of the landfill cap for erosion, vegetative growth, ponding, and obstructions.
- Inspection of the condition of the gas vents, gas probes, monitoring wells, piezometers, and stream gages.
- Monitoring for settlement of the landfill cap once per year during the 30-year post-closure period (TtEC, 2008).

O&M, or post-closure care, at RDA must be performed for 30 years after the landfill closure in accordance with the ROD and Massachusetts regulation, 310 CMR 19.000.

2.3.4 Long-Term Monitoring

Long Term Monitoring (LTM) activities commenced at the RDA during February 2007. LTM activities are described in the *Final Quality Assurance Project Plan for Long Term Monitoring* (QAPP) and the *Final Quality Assurance Project Plan Addendum 1* completed by TtNUS on March 2007 and August 2008, respectively. The components of the RDA LTM include:

- Groundwater and surface water monitoring.
- Annual sediment monitoring during the first 5 years of monitoring.
- Landfill gas monitoring.
- Groundwater and surface water level monitoring.
- One small mammal tissue sampling event.
- Semi-annual (spring/early summer and late summer/early fall) wetland inspections for the first 5 years of long term monitoring.

Seven new overburden groundwater monitoring wells (RDA-TT01 through RDA-TT07) and six piezometers (RDA-PZ01 through RDA-PZ06) were installed between February 27, 2007 and March 6, 2007 (Figure 2-2). One monitoring well (RDA-TT07) was installed through the cap, near the central portion of the landfill. Five monitoring wells (RDA-TT02 through -TT06) were installed in downgradient positions along the eastern landfill boundary adjacent to wetlands. One monitoring well (RDA-TT01) was installed in an upgradient position northwest of the landfill. Three existing monitoring wells were incorporated into the LTM well network. The wells included bedrock monitoring wells RDA-MW50D and –MW50D2, located on the eastern boundary of the landfill, and overburden monitoring well RDA-MW05, located in northwest of the landfill in an upgradient location.

Groundwater monitoring was initiated on March 2007 and samples were analyzed for volatile organic compounds (VOCs) [including 1,2,dibromomethane (EDB) and 1,2-dibromo-3-chloropropane (DBCP)], semivolatile organic compounds (SVOCs) [including polycyclic aromatic hydrocarbons (PAHs)] by full scan and selected ion monitoring (SIM) mode, pesticides, PCBs, herbicides, total metals (filtered and unfiltered), cyanide, volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), ferrous ion, and the indicator parameters: alkalinity, chemical oxidation demand (COD), chloride, nitrate, sulfate, and total dissolved solids (TDS).

Six piezometers were installed outside the wooden railing along the eastern boundary of the wetland. Piezometers were installed to evaluate groundwater flow patterns in the overburden aquifer and to monitor for the potential presence of non-aqueous phase liquid (NAPL). One stream gage was installed at each piezometer location, with the exception of RDA-PZ05. Stream gauges were installed to monitor for potential flooding of the landfill. RDA-PZ01 was installed at the north end of the landfill. Two stream piezometers and staff gauges are located off site, in Old Swamp River, upstream and downstream of the landfill (TtNUS, 2007). The stream piezometers were installed to assess the interchange between surface water and groundwater and the stream staff gauges were installed to monitor for potential flooding.

Surface water and sediment sample locations were established in May 2007 and samples were collected during the second round of monitoring in June 2007. Three collocated surface water and sediment sample locations (RDA-SW01/SD01 through –SW03/SD03) were located along the eastern boundary of the landfill in the adjacent wetland. Sediment samples consisted of compositing eight aliquots at each location. Two additional surface water sample locations (RDA-SWU and –SWD) and associated piezometers (RDA-SPZ101 and –SPZ102) and stream gauges (RDA-G101 and -G102) were established in Old Swamp River in upgradient (130 feet upstream of the confluence of Old Swamp River and the Feeder Stream) and downgradient (at the foot of the second corrugated conduit) locations.

Surface water samples were analyzed for VOCs, SVOCs (including PAHs), pesticides, PCBs, herbicides, VPH, EPH, total metals (unfiltered and filtered), cyanide, and wet chemistry parameters (alkalinity, nitrate, chloride, sulfate, and TDS). All sediment samples were analyzed for VOCs, SVOCs (including PAHs), pesticides, PCBs, VPH, EPH, total metals, cyanide, and percent solids.

Landfill gas monitoring was initiated in March 2007 at eight gas vents (GV-01 through -08) and seven gas probes (GP-01 through -07) in order to assess whether gas is migrating beyond the boundaries of the landfill. Monitoring was conducted with real time direct-read field instruments which included portable landfill gas monitors and a flame ionization detector (FID). Readings were taken for total VOC concentrations, percent lower explosive limit (LEL)/methane, percent oxygen, hydrogen sulfide [in parts per million (ppm)] and percent carbon dioxide.

Three small mammal tissue sample areas were established and sampled in September 2008. In accordance with the LTMP, one sampling event was required prior to completion of the five year review. Samples were collected to assess the potential for bioaccumulation of PCBs in small mammal tissue due to contact with soils containing PCBs. Sample areas were located on the northern end of the landfill (RDA-ET01), in the area of the former PCB hotspot (RDA-ET02), and in areas across the southern

portion of the landfill (RDA-ET03). Whole-body tissue samples were analyzed for PCB homologs and percent lipids.

All sample locations were surveyed in June 2007 by a licensed surveyor, registered in the Commonwealth of Massachusetts. The LTM locations are summarized in Table 2-2.

A total of eight quarterly monitoring rounds were completed by December 2008. This five-year review incorporates data from the first seven rounds since the December 2008 data have not yet been validated. The following table summarizes the monitoring activities conducted during the first 2 years.

Monitoring Year	Date of Monitoring	Monitoring Activities
Year 1	March 2007	Groundwater, landfill gas monitoring
	June 2007	Groundwater, surface water, sediment, and landfill gas monitoring.
	September 2007	Groundwater, surface water, and landfill gas monitoring.
	December 2007	Groundwater, surface water, and landfill gas monitoring.
Year 2	April 2008	Groundwater, surface water, and landfill gas monitoring.
	June 2008	Groundwater, surface water, sediment, landfill gas monitoring.
	September 2008	Groundwater, surface water, landfill gas monitoring, and small mammal tissue sampling.
	December 2008	Groundwater, surface water, landfill gas monitoring.

2.3.5 Facility Inspections

The O&M, or facility, inspections have been performed generally coincident with the LTM sampling events. However, the facility inspections commenced in October 2006, prior to the installation of the groundwater and surface water monitoring networks as described in the QAPP (TtNUS, 2007a). Each facility inspection includes the following key components: landfill cap; stormwater drainage system; gas vents and probes; access road; perimeter fence, gate and signage; vegetation; groundwater monitoring system; and surface water monitoring system.

2.3.6 Wetland Inspections

Wetland inspections were conducted in November 2007, June 2008, and September 2008. The LTMP indicated that wetland monitoring would be conducted twice annually for the vegetative component,

annually for the soils component, and at the end of the fifth growing season for the functions and values assessment.

The vegetative component includes an assessment of ten 1-meter square plots and one 200-foot transect at established permanent locations in the restored and created wetlands. An additional 200-foot reference transect adjacent to the 0.41 acre created wetland was also assessed and an additional 1-meter square plot in an area similar to the restored fringe wetland was also sampled for reference. Species composition and percent cover were recorded at each location and, in addition, a Prevalence Index was calculated for the 200-foot transect. Data recorded at each sample location included plant count by species, indicator status, total percent cover, and percent species cover. As part of the herbaceous sampling effort, special attention was paid to the occurrence of invasive species. In addition, soils were examined for the development of hydric soil characteristics. The wetland restoration portion of the LTMP included performance standards to determine that the restored and created wetlands were successfully established.

Wetland functions and values will be assessed at the end of the fifth growing season using the United States Army Corps of Engineers (USACE) New England District Highway Methodology (1995) and Wetland Habitat Indicators for Non Game Species (Whitlock, et. al., 1999). Restored and created wetlands will be evaluated separately.

2.4 PROGRESS SINCE LAST FIVE-YEAR REVIEW

This is the first five-year review for the NAS South Weymouth Site. The triggering date for the review was the start date (July 13, 2004) for the RDA remedial action.

2.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete the review.

2.5.1 Administrative Components

The U.S. Navy's Naval Facilities Engineering Command, BRAC Program Management Office, Northeast, is the lead agency for this five-year review. The NAS South Weymouth points of contacts are David Barney, BRAC Environmental Coordinator, and Brian Helland, Remedial Project Manager. The regulatory agencies that are part of the review team include the EPA and MassDEP.

2.5.2 Community Notification and Involvement

Tetra Tech NUS, Inc. published a legal notice in three local newspapers containing a description of the five-year review process and a request for public participation. The notice was published in The Patriot Ledger on October 21, 2008, the Weymouth News on October 22, 2008, and the Rockland Mariner Standard on October 24, 2008. In addition, the five-year review process was presented to the public at the NAS South Weymouth Restoration Activity Board (RAB) public meeting on November 13, 2008. Interview questionnaires were distributed to town officials and members of the public who attended the RAB meeting. Interviews were scheduled with individuals who expressed interest in participating in the five year review. On November 19, 2008 TtNUS representatives visited the Tufts Library (Weymouth), Memorial Library (Rockland), Abington Public Library, and Hingham Public Library to review the NAS South Weymouth repositories.

Community interest in the RDA was significant at the time of the selection of the remedy in 2003. The majority of responses received during the public comment period on the Proposed Plan indicated a preference for the alternative involving excavation and removal of all waste from the site.

2.5.3 Document Review

The five-year review consisted of a review of relevant RDA documents including decision documents, O&M plans, remedial action reports, long-term monitoring work plans, and long-term monitoring reports (see Appendix A).

2.5.4 Data Review

The RDA is the only site at NAS South Weymouth with a remedy in place and an ongoing long-term monitoring program. This section, therefore, will only include a review of the RDA monitoring data.

A review was completed of data from the RDA quarterly monitoring events from 2007 and the first three quarters of 2008. Although the most recent monitoring round at the RDA was conducted in December 2008, data validation of analytical results was not completed at the time of this review. The review also included the facility inspections performed between October 2006 and November 2008, the small mammal sampling event, and wetland inspections. A summary of relevant data regarding the components of the RDA remedy is presented below.

2.5.4.1 Long-Term Monitoring

The LTMP includes groundwater, surface water, sediment, small mammal tissue, landfill gas monitoring, groundwater level monitoring, and surface water level monitoring. These activities are described in the QAPP and summarized in Section 2.3.4. The results of routine long-term monitoring conducted in 2007 (Round 1 - March, Round 2 - June, Round 3 -September, and Round 4 - December) and in 2008 (Round 1 - April, Round 2 - June, and Round 3 - September) are discussed in this section.

Groundwater and landfill gas monitoring were conducted for all four rounds in each year. Surface water monitoring was conducted during Rounds 2 through 4 in 2007 and four rounds in 2008; sediment monitoring was conducted during Round 2 of each year. Sample locations are included in Figure 2-2. Analytical results for all samples collected in 2007 and 2008 are presented in tables referenced in the following discussion. The monitoring results are discussed below by media and analyte group.

Groundwater Sampling

During groundwater sampling, a groundwater recharge issue at the background monitoring wells was identified. Specifically, low-flow purging difficulties related to dewatering and recharge rates were noted at background monitoring wells RDA-MW05 and -TT01, and at RDA-TT06. To compensate for these difficulties, a modified purging/sampling technique and a sample analysis hierarchy were implemented when necessary. At most wells, drawdown was not an issue, and indicator parameters stabilized within 2 hours, with turbidity measurements less than or equal to 5 NTUs.

According to the QAPP, if a well is incapable of producing a sufficient volume of sample at any time, sampling personnel should obtain the largest volume available and record the quantity in the field logbook. For poor-producing wells this sometimes required multiple days for sample collection.

At wells with drawdown/recovery problems, modifications were made to the QAPP-specified low-flow sampling procedures during 2007-Rounds 1 and 2. Beginning with the 2007-Round 3 event, the standing water volumes in RDA-MW05, –TT01, and –TT06 were evacuated three times over 3 days prior to sampling on the fourth day. Sample collection at each well was limited to 1 day and the volume of groundwater available in the casing after recharge of the well. The priority of analyses for sample collection at these wells was typically: all VOCs, pesticides, PCBs, metals, cyanide, SVOCs, PAHs, herbicides, key wet chemistry/natural attenuation parameters, and EPH.

Groundwater Monitoring

Groundwater monitoring results were compared to Site Remedial Goals (RGs) for benzo(a)pyrene, arsenic, and manganese, and federal and state drinking water standards (MCL/MMCL), where applicable. Summary statistics for groundwater samples from 2007 and 2008 are presented in Tables 2-3 and 2-4, respectively. Analytical results for compounds detected in groundwater are presented in Table 2-5 (2007) and Table 2-6 (2008).

VOCs

Low concentrations of nine VOCs were detected in 2007; five VOCs were detected in 2008. The majority of the maximum concentrations of VOCs in both years were detected in monitoring well RDA-TT05. In 2007 three monitoring wells (RDA-MW05, -MW50D2, and -TT03) had no detections of VOCs and in 2008 seven monitoring wells (RDA-MW05, -MW50D, -MW50D2, -TT01, -TT02, -TT06, and -TT07) had no detections of VOCs. In 2007, the three most frequently detected VOCs were cyclohexane (in 13 of 44 samples), chlorobenzene (in 10 of 44 samples), and methyl cyclohexane (in 9 of 44 samples). In 2008, chlorobenzene was the most frequently detected VOC (in 7 of 33 samples) followed by isopropylbenzene (in 4 of 33 samples). No MCL/MMCL criteria were exceeded in 2007 and 2008 and no RGs have been established for VOCs.

SVOCs

Twenty SVOCs, including 15 PAHs and 3 phenols, were detected at low concentrations in nine locations during the 2007 monitoring rounds. In 2008, five SVOCs were detected at lower concentrations and in just five locations. No SVOCs were detected at TT03 and TT04 in 2007 or at TT03, TT04, TT06 and MW05 in 2008. The majority of maximum concentrations were detected in monitoring well RDA-TT07 in both years. In both years, the two most frequently detected compounds were acenaphthene and 2-methylnaphthalene. In 2007, benzo(a)pyrene was detected once (RDA-TT07, Round 1); the concentration exceeded the RG. Benzo(a)pyrene was not detected in any other 2007 or 2008 groundwater samples. No SVOCs were detected at concentrations exceeding their respective MCL or MMCL criteria.

VPH/EPH

In 2007, volatile petroleum hydrocarbons (VPH) were detected at 14 monitoring well locations and in 2008 VPH was detected in 9 locations. None of the VPH concentrations exceeded the MMCL criteria. In both years, the maximum concentration was detected in monitoring well RDA-TT05.

In 2007 and 2008, total extractable petroleum hydrocarbons (EPH) were reported in one location, RDA-TT06 (both in Round 2). The detected concentrations did not exceed the MMCL criteria.

Pesticides/PCBs

In 2007, three pesticides (alpha-chlordane, gamma-chlordane, and heptachlor epoxide) were detected in groundwater at trace levels. No pesticides were detected in groundwater samples collected in 2008. In 2007, Aroclor 1254 was detected in two samples (RDA-TT06 and RDA- MW50D2), both in Round 1. One of the two detections, at TT06 (1.2 µg/L), exceeded the MCL/MMCL of 0.5 µg/L during the first round in 2007. No PCBs were detected in any of the subsequent monitoring rounds in 2007 or in 2008.

Herbicides

In 2007, the herbicide, dicamba, was reported at TT02 during LTM Round 3 only. In 2008, one herbicide, MCPA, was detected in one sample (RDA-TT06) collected in the third round of groundwater monitoring. No MCL/MMCL criteria exist for these compounds.

Total Metals/Cyanide

In 2007, 20 metals were detected in groundwater samples; 18 metals were detected in the first three monitoring rounds of 2008. Arsenic concentrations exceeded the RG in 11 samples collected during 2007. In 2008 arsenic was not detected above the ROD-based RG in any groundwater samples.

In 2007 manganese was detected in groundwater at concentrations exceeding the RG at all monitoring wells except in TT06 and TT01 (during Rounds 1 and 2). In 2008 manganese was reported at concentrations exceeding the RG at all monitoring well locations, with the exception of location TT06.

Thallium was not detected in groundwater samples from any well until the 2007 Round 4 sampling event, when it was reported in 9 out of the 10 samples collected, all at concentrations exceeding the MCL of 2 µg/L. The data usability assessment for Round 4-2007 noted that the Project Quantitation Limit (PQL) for thallium did not meet the regulatory limits. Thallium concentrations exceeding the MCL were also detected in Round 1-2008. Beginning with Round 2-2008, all quarterly sampling events have used EPA Method 6020, a more sensitive analytical method (ICP-MS) for thallium. No thallium has been detected since the change in the analytical method was implemented. The analytical laboratory indicated that the Method 6010 results are likely false positive detections.

The MCL for lead was exceeded in 2007 in one sample out of seven detections, in upgradient well MW05 during LTM Round 2 only. Lead was not detected in groundwater in 2008. Cadmium was not detected in 2007. In 2008 cadmium was detected at two locations (RDA-TT03 and RDA-TT07, Round 1) at concentrations above the MCL/MMCL criteria.

In 2007, cyanide was detected in three samples from locations RDA-TT04 and -TT05. The maximum concentration did not exceed MCL/MMCL criteria. In 2008, cyanide was detected in five samples from locations RDA-MW50D, -TT03, -TT04, and -TT06. The maximum concentration did not exceed MCL/MMCL criteria.

Dissolved Metals

In 2007, 19 metals were detected and in 2008, 18 metals were detected in filtered groundwater samples. In 2007 dissolved arsenic was reported exceeding the ROD-based RG in nine samples. In 2008 arsenic was not detected above the RG in any groundwater samples. In 2007 manganese was detected at all locations above the RG with the exception of two samples from TT01 and three samples from TT06. In 2008 manganese was detected at all locations above the RG, with the exception of location RDA-TT06.

In 2007, thallium was detected in nine samples above the MCL/MMCL. In 2008, thallium was detected in Round 1 at seven monitoring well locations above the MCL/MMCL, before the change to EPA Method 6020. Cadmium (2008) was detected at two locations (RDA-TT03 and RDA-TT07) above the MCL/MMCL criteria.

Surface Water Monitoring

Surface water sampling was conducted for three quarterly sampling events (Round 2, Round 3, and Round 4) in 2007 and three quarterly sampling events (Round 1, Round 2, and Round 3) in 2008 at three locations east and adjacent to the RDA (SW01, SW02, and SW03) and two locations in Old Swamp River (SWU and SWD) (Figures 2-2 and 2-3). Analytical results were compared to U.S. EPA National Recommended Water Quality Criteria (NRWQC), when available. Summary statistics for 2007 and 2008 surface water samples are included in Tables 2-7 and 2-8 and complete analytical results for compounds detected in surface water in 2007 and 2008 are presented in Tables 2-9 and 2-10, respectively.

VOCs

In 2007 four VOCs were detected in five samples (mostly in Round 2). In 2008 the same four VOCs plus two others were detected. None of the VOCs detected have associated NRWQC values. The majority of the detections were at sample location SW03. No VOCs were detected in Old Swamp River.

VPH/EPH

In 2007 and 2008 VPH were detected at just one surface water location (RDA-SW03) during Round 2-2007 and Round 1-2008. In 2007 EPH were detected in four samples. The highest concentrations were from location SW03. In 2008, EPH were detected in one sample (SW03, Round 2). NRWQCs are not established for VPH/EPH.

SVOCs

Eleven SVOC compounds were detected in surface water samples collected in 2007. In 2008, nine SVOCs were detected. Most compounds were detected very infrequently and at low concentrations. The location with the most detections was SW03. None of the SVOCs were detected at concentrations exceeding NRWQC values.

Pesticides/PCBs

Eleven pesticide compounds were detected in surface water samples collected in 2007. In 2008, only three pesticides were detected. In 2007, 5 of the 11 pesticides detected had associated NRWQC values, all of which were exceeded in each detection (in just one to three samples). In 2008, one of the detected pesticides had a NRWQC criteria which was exceeded in two samples.

In 2007 Aroclor-1260 was reported in two surface water samples at a concentration that exceeded the associated NRWQC. No PCBs were detected in surface water samples collected in 2008.

Herbicides

Three herbicides were detected in one surface water sample, from one sampling event, conducted in 2007. NRWQCs are not established for these compounds. No herbicides were detected in 2008.

Total Metals/Cyanide

Eighteen metals were detected in 2007 and 21 metals were detected in 2008 in unfiltered surface water samples. In 2007, maximum concentrations of 11 of these metals were detected in sample location SW01 in Round 2 (June). In 2008, 15 of the maximum concentrations were detected in sample location SW03; 11 of the 15 maximum concentrations were from Round 2. NRWQC values are not applied to total metals concentrations.

Cyanide was not detected in 2007. In 2008, cyanide was detected in three samples from location SW02 and SW03. The maximum cyanide concentration was found in sample SW03.

Dissolved Metals

In 2007, 16 dissolved metals were detected and in 2008 17 dissolved metals were detected in 2008 in filtered surface water samples. Of the dissolved metals detected, eight have associated NRWQC (dissolved) metals values, three of which were exceeded (aluminum, iron, and lead). The exceedances were at SW01 and SW03 in some, but not all, rounds. Exceedances of NRWQC in 2008 included aluminum at SW03 (Round 2) and iron at SW01, SW02, and SW03 in all rounds.

Sediment Monitoring

The annual sediment sampling for 2007 and 2008 was conducted during the second LTM round. Sediment samples were collected from three locations, co-located with the three surface water sample locations that are in the wetland area along the eastern boundary of the Site (Figure 2-3). There are no sediment cleanup levels or remedial goals specified in the ROD. Summary statistics for 2007 and 2008 sediment samples are presented in Tables 2-11 and 2-12 and complete analytical results are presented in Tables 2-13 and 2-14.

VOCs

Six VOCs (acetone, 2-butanone, toluene, chlorobenzene, isopropyl benzene, and methyl cyclohexane) were detected in sediment samples from both years. In 2007 cyclohexane was also detected; in 2008 BTEX (benzene, toluene, ethylbenzene and xylene) was also detected. In each year, VOCs were detected in all three sample locations, with the greatest number of VOCs detected at SD03.

VPH/EPH

Sediment analytical results for petroleum contaminants indicate VPH and EPH are present, primarily at SD01 and SD02. At location SD03, no VPH was detected in either year; only one EPH carbon range (C19-C36 aliphatics) was detected in 2007 and none in 2008.

SVOCs

In 2007, 19 SVOCs (including 17 PAHs) were detected in sediment samples. Nearly all of the PAHs were detected in all four samples. The maximum concentrations of PAHs were reported at either location SD02 (10 maximums) or SD01 (7 maximums). Benzo(a)pyrene, a PAH, was detected in all four sediment samples, and the highest concentration was reported at SD02.

In 2008, 25 SVOCs (including 17 PAHs) were detected in the sediment samples. Fourteen of the 17 PAHs were detected in all four sediment samples. The maximum concentrations for all the 17 PAHs were detected in the sediment sample from SD02. Benzo(a)pyrene was detected in all four sediment samples with the highest concentration at SD02.

Pesticides/PCBs

In 2007, eight pesticides were detected during sediment monitoring. Sample location SD01 had the highest number of pesticide compounds reported and the maximum concentrations for six of the eight pesticides detected. 4,4'-DDE was the only pesticide compound which was detected in all samples. A low concentration of the PCB, Aroclor-1242, was detected in the SD01 duplicate sample. Low levels of Aroclor-1260 were also reported in the SD01 sample and its duplicate and SD02.

In 2008, six pesticides were detected in one or more of the sediment samples. The detected pesticides include: 4,4'-DDD (SD01, SD02, and SD02-D); 4,4'-DDE (SD02 and SD03); alpha chlordane (SD03); delta-BHC (SD03); endosulfan sulfate (SD02-D); and gamma-chlordane (SD03). The maximum concentrations for the six pesticides were found either at SD02 or SD03. PCB compounds were not detected in the sediment samples collected during the LTM Q2-2008 event.

Metals

In 2007, 20 metal compounds were detected in sediment samples, 16 were reported with maximum concentrations at location SD01. Seventeen of the 20 metals were detected in all samples; beryllium was detected only in SD02, and selenium and silver were detected in two sediment samples.

In 2008, 22 metals were detected in one or more sediment samples. Twenty of the 22 detected metals were found in all four sediment samples. Antimony was detected in samples SD01, SD02, and SD02-D. Thallium was detected only in sample SD02-D. There was a wide range in the detected concentrations of metals in sediment. The maximum concentrations of 13 of the 22 detected metals were found in SD02 or SD02-D. Cyanide was detected in sample SD02.

Landfill Gas Monitoring

Landfill gas monitoring was performed during each quarter of monitoring in 2007 and 2008 to evaluate whether landfill gases are migrating in the soil to off-site locations and to measure changes in landfill gas composition over time. A total of seven perimeter gas monitoring probes (GP-01 through GP-07) and eight passive gas vents (GV-01 through GV-08) were monitored (Figure 2-2).

Combustible gases all have a lower explosive limit (LEL) and an upper explosive limit (UEL). The LEL and the UEL are measures of the percent of gas in the air by volume. At concentrations below the LEL and above the UEL, a gas is not considered explosive. An explosion hazard may be present if a gas level is measured between the LEL and the UEL, oxygen is present, and an ignition source is available. The explosive limits of methane are 5 percent to 15 percent by volume in air under normal atmospheric conditions. Five percent methane is approximately equivalent to 100 percent LEL.

Landfill gas monitoring results from 2007 indicate there are several potential methane-enriched areas at the RDA (Table 2-15). Measurements taken at gas probes GP-01 and GP-02, near the northern perimeter of the Site boundary, recorded methane concentrations exceeding 25 percent (and usually exceeding 50 percent) during all four quarterly events. These concentrations are above the UEL. Oxygen levels at GP-01 and GP-02 were low. The majority of the oxygen readings were zero percent, with a maximum oxygen level of 3 percent. At gas vent GV-06, near the apex of the landfill, methane ranged from 10.1 to 21.4 percent, with oxygen ranging from 8.9 to 15.8 percent. During the second quarterly event (Q2), 6 percent methane was measured at GV-04, which is also located near the apex of the landfill. Oxygen levels at this vent were measured at 12.7 percent. Methane concentrations at GP-04, -05 and -06, along the west perimeter of the Site were variable, ranging from below the LEL, to between the LEL and UEL, to above the UEL.

Monitoring results from all four 2007 LTM events indicate that little to no methane was detected in gas vents GV-02, GV-03, GV-05, GV-07 and GV-08, and in gas probes GP-03 and GP-07. PID readings indicated low concentrations of VOCs were detected only during Q4, and only at GP-03, GV-07, and GV-

08. The detections of VOCs measured with an FID were presumed to be methane because this instrument (unlike the PID) is calibrated with and responds effectively to methane.

Landfill gas monitoring results from 2008 (Table 2-15) confirmed that there are several potential methane-enriched areas at the RDA: two areas near the northern perimeter of the Site boundary (GP-01 and GP-02), and two areas along the western perimeter of the Site (GP-05, GP-06). Methane concentrations at GP-01 and GP-02 exceed 20 percent which is above the UEL. The methane concentrations at GP-05 and GP-06 were below the LEL. Monitoring results indicate that little to no methane was detected in any of the eight gas vents, GV-01 through GV-08. Similarly, no methane was detected in gas probes GP-03, GP-04, and GP-07.

Groundwater Level Monitoring

Groundwater level monitoring was conducted during all monitoring rounds in 2007 and 2008. The monitoring documented that the general groundwater flow direction in overburden at the RDA is relatively consistent, toward the east-southeast. A comparison to groundwater elevations presented in the 2001 Phase II RI Report indicates that groundwater elevations in the shallow aquifer remain fairly consistent across the Site. It does not appear that the landfill cap has altered the pre-cap groundwater flow pattern at the Site. No NAPL was detected during 2007 and 2008 groundwater level monitoring activities. Specifics regarding groundwater level monitoring can be viewed in the quarterly monitoring reports for 2007 and 2008.

There are only two bedrock wells are located on the Site: RDA-MW50D2, screened entirely within bedrock; and -MW50D, screened across the overburden/weathered rock interface. Water level data from these wells were used for general comparison purposes to overburden water levels. Based on groundwater elevations at this bedrock well cluster, a slight upward gradient from deeper bedrock (at MW50D2) to shallow bedrock (at MW50D) was indicated during 2007 and 2008.

Vertical gradients between groundwater and surface water were evaluated at piezometer/surface water gauge locations. At those locations where gradients between groundwater and surface water could be calculated, either upward gradients (groundwater discharging to surface water) or neutral gradients have been consistently observed. At locations where neutral gradients were observed, little if any exchange is likely occurring between groundwater and surface water.

The greatest differences in head have typically been measured in the vicinity of surface water sample locations SW02 (and near TT03) and SW03. Both SW02 and SW03 are locations where potential groundwater seeps have been noted. At the piezometers/surface water gauge locations in Old Swamp

River, positive (upward) head differences have been measured, indicating that groundwater has the potential to discharge to surface water (e.g. a gaining stream). No downward gradients (surface water recharging groundwater) have been measured.

Surface Water Level Monitoring

In accordance with the LTM QAPP, TtNUS monitors water levels at all of the Site gauges when flood warnings are issued for Old Swamp River and/or immediately after a 25-year storm event. During each monitoring period precipitation data was collected and evaluated; however, monitoring for potential flooding and scouring of the landfill was not necessary. Flood warnings were not posted for Old Swamp River during 2007 and 2008. Moderate drought affected the east-central portion of the State of Massachusetts, including Weymouth, in 2007. Specifics regarding surface water level monitoring can be viewed in the quarterly monitoring reports for 2007 and 2008.

2.5.4.2 Facility Inspections

The landfill inspections conducted in 2007 and 2008 concluded that overall the landfill cap is in good condition and functioning according to the design, including the vegetative cover, storm water drainage system, gas vents and probes, and perimeter road, fence and signage. The inspections noted vehicle ruts from the monitoring well drilling equipment; repairs were recommended. There was some evidence of possible trespassing along the access road and in the parking area by the vehicle gate. Animal burrows and small areas of erosion were noted; additional monitoring was recommended. In addition, a settling monument survey needs to be conducted. Vegetation and shrubs established in the stormwater drainage channel were removed in November 2008. Mowing of the vegetated cap and rut repair and reseeding are planned for Spring 2009.

2.5.4.3 Small Mammal Tissue Monitoring (2008)

Small mammal tissue sampling was conducted during the LTM Round 3-2008 event. White-footed mice (*Peromyscus leucopus*) were collected from three sampling areas, RDA-ET01, -ET02, and –ET03 (Figure 2-4). Sample area ET01 extended from gas vent GV08 to Old Swamp River, and southeast to the wetland. Sample area ET02 was in the former PCB hotspot area and extended up to gas vent GV07; sample area ET03 included most of the southeast end of the landfill. Composite whole body samples consisting of at least five individual mice from each area were submitted for laboratory analysis. PCB homolog analysis (EPA Method 680) and percent lipids analysis (EPA Method 8290) were performed.

Four PCB homologs (dichloro-, hexa-, hepta-, and octachlorobiphenyls) were detected in sample RDA-ET02. The total PCB result for this sample was 320 µg/kg. Dichlorobiphenyls were detected in sample RDA-ET03 with a total PCB value of 0.64 µg/kg. No PCB homologs were detected in sample RDA-ET01. Small mammal summary statistics data is presented in Table 2-16 and analytical results for detected compounds are presented in Table 2-17. The small mammal tissue PCB concentrations reported in the RI ranged from 600 to 5,000 µg/kg.

2.5.4.4 Wetland Inspections (2007 and 2008)

Post-remediation wetland monitoring was conducted on November 13 and 14, 2007 (Fall 2007), June 10 and 12, 2008 (Spring 2008), and September 10 and 11, 2008 (Fall 2008) following procedures described in the LTMP (TtEC, 2005), and the Final LTMP, Revision 1 (TtEC, 2007).

Each of the inspected areas in the restored and created wetlands support dense emergent vegetation throughout; thus, no reseeding is necessary to meet the performance standard regarding minimum vegetative cover. During the Fall 2007 and Spring 2008 inspections, the performance standard regarding a minimum of 80 percent aerial cover by non-invasive species was met in the created wetlands. The cover in the restored wetlands has fallen just short of the performance standard (up to 75 percent) due to the presence of the invasive species, purple loosestrife and common reed. However, during the Fall 2008 inspection, the standard regarding a minimum of 80 percent aerial cover by non-invasive species was not met in either the restored or created wetlands. The current coverage by non-invasive species fell short of the standard due primarily to the presence of purple loosestrife. This invasive plant was found in eight of the ten plots within the created and restored wetlands. During the 2008 inspections defoliation damage on purple loosestrife plants was noted, including defoliating insects and/or damage to the leaf tissue.

Glossy buckthorn is present in the reference wetland. It is especially abundant along the boundary with the created and restored wetlands. During the Fall 2008 field effort, numerous glossy buckthorn seedlings were observed within the boundary of created and restored wetlands. The LTMP recommends manually removing newly established seedlings (less than 3/8-inch caliper) and plants of glossy buckthorn.

Trends suggest that the soils and hydrology standards will be met. Despite a slow start, attaining the performance standard regarding tree and shrub recruits appears to be possible by the end of the fifth year.

2.5.5 Site Inspection

A site inspection was conducted at the Site on November 21, 2008 by Tetra Tech personnel (see Appendix B). The purpose of the inspection was to assess the protectiveness of the remedy, including the integrity of the cap, the condition of drainage structures, and the presence of fencing and signage to restrict access.

The capped landfill was well vegetated; no major erosion or damage to the cap was noted. Minor areas of erosion and vehicle ruts were observed. Signs were posted at two locations along the perimeter of the landfill warning presence of a capped landfill. Monitoring wells and gas vents appeared to be in good condition and secured with locks.

Small bushes and small areas of protruding geotextile fabric were observed in several areas.

2.5.6 Interviews

Tetra Tech personnel conducted interviews with town officials at the town halls in Weymouth, Rockland, and Abington. At the Town of Weymouth, sample interview question forms were distributed to administrative assistants for the Mayor, Town Council, and Health Department. Interviews were conducted with the Town Clerk and the Conservation Administrator. Zoning maps were reviewed at the Planning Division.

At the Towns of Rockland and Abington, interview questionnaires were distributed to the administrative assistants for the Town Administrator (Rockland), Town Manager (Abington), Board of Selectmen (Rockland), Town Selectmen (Abington), and Board of Health (Rockland and Abington). The Town Clerk (Rockland and Abington) was interviewed and zoning maps were reviewed at the Building Department.

Tetra Tech personnel interviewed reference librarians at the following public libraries and briefly described the five-year review process: Tufts Library (Weymouth), Memorial Library (Rockland), Abington Library, and Hingham Library. Each librarian indicated that the level of interest in the NAS South Weymouth documents was not very high compared to several years ago. Several librarians requested Navy direction on how long they were required to retain the documents and if older reports could be discarded. The Memorial Library in Rockland was limited by the amount of storage space in their reference section.

Tetra Tech personnel conducted interviews by phone with health department officials from Weymouth and Abington, with a member of the SSTTDC, and with an active RAB meeting attendee. The general

sentiment was that the remedy at the RDA was conducted appropriately and that the individuals interviewed felt well informed regarding activities at the Base. Positive input was recorded regarding the presence of a BRAC coordinator and a document repository at the Base. Concerns expressed by those interviewed included: elevated levels of methane in landfill gas at the RDA, elevated concentrations of arsenic and manganese in groundwater at the RDA, the appropriateness of the future recreational designation for RDA, illegal dumping of residential waste along the Base perimeter, delays in completion of Base documents, and placing restrictions on sites rather than choosing to remove contamination.

Complete interview records are included in Appendix D.

2.6 TECHNICAL ASSESSMENT

This section provides a technical assessment of the remedy implemented at the RDA, in the form of responses to the three questions outlined in the Comprehensive Five-Year Review Guidance (EPA, 2001). The assessment evaluated: whether the remedy is functioning in accordance with the decision documents; whether remedial action objectives (RAOs) have changed or been updated; and whether any other information exists that could affect the remedy's protectiveness. Action specific ARARs, including post-closure care O&M requirements, were identified during the remedial design process for the on-site landfill cap.

2.6.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

Remedial Action Performance

The on-site landfill cap is in good condition and is functioning as designed. It is covered by grasses which were observed to be up to 3 feet tall in some areas. Mowing is planned for 2009. The eight passive gas vents and seven gas probes appeared to be in good condition. Signs are posted on the southwestern and northern landfill boundary warning of the presence of a closed landfill. The drainage swale located along the north side of the landfill appeared in good condition, but contained some low-lying vegetation and several bushes. As recommended, the vegetation in the swale was removed in November 2008. Minor areas that require continued monitoring but no repairs and do not affect the performance of the remedial action include: small sections of exposed geotexile fabric along the boundary of the landfill, with the largest section visible along the northern landfill boundary; several small areas of erosion along the landfill boundary; and vehicle ruts associated with LTM activities on the landfill cap.

Groundwater level measurements indicate that general groundwater flow in the overburden is towards the east-southeast. Based on a comparison to groundwater elevations presented in the 2001 Phase II RI

Report, it does not appear that the landfill cap has altered the pre-cap groundwater flow pattern at the site.

Long Term Monitoring Performance

Long-term monitoring activities continue to be conducted consistent with the QAPP, and subsequent modifications. Modifications of the QAPP, which have included small mammal tissue sampling, have been approved by EPA and MassDEP.

Low-flow purging difficulties related to dewatering and recharge rates were noted at background monitoring wells RDA-MW05 and -TT01, and at RDA-TT06, as detailed in the quarterly reports. Beginning in Round 3-2007 modified purging/sampling techniques were implemented when necessary. Sample collection at each well was limited to 1 day and the volume of groundwater available in the casing after recharge of the well. During some events an incomplete suite of analyses was performed due to insufficient sample volume.

Long-term monitoring has been completed for four rounds each in 2007 and 2008. This draft five year review evaluates the four 2007 rounds and the first three rounds completed in 2008. Data validation of the analytical results from the fourth round conducted in December 2008 has not been completed.

Groundwater Monitoring

Groundwater monitoring has been conducted during each monitoring round in 2007 and 2008. Monitoring has detected concentrations of contaminants that have exceeded ROD-based RGs and/or MCL/MMCL criteria. Manganese was the most widespread and consistently-detected compound with concentrations exceeding the RG. RG exceedances were reported in all wells in all quarters with the exception of TT06 and TT01 (2007-Rounds 1 and 2). The distribution of manganese in on-site and downgradient wells indicates that the highest concentrations were detected in the southern-most well, TT04, and the lowest concentrations were in the northern-most well, TT06. Neither well exhibited any obvious trend in manganese concentrations in 2007; a decrease in concentrations was seen at TT04 in 2008. The monitoring wells north of TT04 exhibit fairly consistent, high manganese concentrations. Further north, manganese concentrations in bedrock wells MW50D and MW50D2 were fairly stable (see trend graph in Figure 2-5).

In 2007, an upward trend in manganese concentrations was noted in downgradient wells TT02 and TT05, while concentrations appeared to remain fairly stable at TT07, within the landfill. The data suggest that concentrations of manganese in groundwater in the eastern area of the Site generally appear to decrease

from south to north. Overall, trends in manganese concentrations in 2007 indicate either upward trends, or no definitive trends; downward trends in manganese concentrations were not observed. In contrast, in 2008 a downward trend in manganese concentrations was noted in the downgradient well TT04; a slight downward trend was noted at downgradient well TT02. Trends in concentrations will continue to be evaluated after additional data are acquired during future sampling events. Manganese concentrations at each monitoring well for each monitoring round are graphically presented in Figure 2-5.

Miscellaneous groundwater parameters collected during groundwater monitoring events indicate the presence of strongly reducing conditions supporting anaerobic degradation at TT07 and the downgradient wells, TT02, TT03, MW50D, and MW50D2. The reducing conditions indicated by the low ORP values at many monitoring wells likely reflects the high organic content of the material within the landfill and the adjacent wetlands. Since reduced forms of metals such as iron and manganese are more soluble, the elevated concentrations of iron and manganese in groundwater are to be expected. Over time, the geochemistry is expected to change as the landfill materials naturally biodegrade.

The RG for arsenic was the second most frequently exceeded criterion in groundwater. In 2007, most arsenic RG exceedances were in and downgradient of the centrally-located well TT07, including downgradient well TT03 and bedrock wells MW50D and -50D2, immediately north of TT03 (Figure 2-3). Arsenic concentrations at these four locations each exceeded the RG in Rounds 1 (March 2007) and 3 (September 2007) (for both total and dissolved arsenic). During 2007-Rounds 2 and 4, arsenic was either not detected in these four wells (Round 4), or was detected at very low concentrations (up to 4.6J µg/L, in Round 2). These four wells are also four of the five locations where anaerobic, highly reducing conditions were measured. In 2008 no RG exceedances of arsenic were observed in any well. Although all detected concentrations were below the RG, a slight upward trend was noted. Arsenic concentrations at each monitoring well for each monitoring round are graphically presented in Figure 2-6.

Thallium was not detected in any groundwater samples until Round 4-2007, when it was reported in 9 out of the 10 samples collected, all at concentrations exceeding the MCL. Since the recommended change to the more sensitive EPA Method 6020 was implemented in Round 2-2008, thallium has not been detected in groundwater.

In both years total and dissolved lead were infrequently detected. In 2007 the MCL for lead was exceeded in one sample: upgradient well MW05 (total lead only) during Round 2. No detections of total lead were observed in 2008. In both years the low detected concentrations of dissolved lead did not exceed the MCL.

In April 2008, cadmium was detected in two locations, TT03 and TT07, at concentrations slightly exceeding the MCL in both total and dissolved fractions. The maximum concentration detected at both locations was 5.7 µg/L, slightly greater than the MCL (5 µg/L).

Benzo(a)pyrene, and the PCB, Aroclor 1254, were detected at concentrations exceeding criteria in groundwater samples collected during Round 1-2007 only. Benzo(a)pyrene was detected at TT07 at a concentration exceeding the MCL/MMCL and the RG, which are both 0.2 µg/L. Aroclor-1254 was detected at TT06 (1.2 µg/L), exceeding the MCL/MMCL of 0.5 µg/L. This well is in the vicinity of the former PCB excavation area (Figure 2-2). The other detection of Aroclor-1254 at bedrock well MW50D2 was below the MCL/MMCL. Neither of these two compounds was detected in samples from Rounds 2 – 4 in 2007 and Rounds 1 – 3 in 2008.

In summary, the concentrations of manganese remain well above the RG, with indications at some wells of a downward trend. Arsenic, benzo(a)pyrene, Aroclor 1254, and lead RG or MCL/MMCL exceedances appear to have been isolated instances that only occurred in the first year of monitoring. The thallium exceedances may have been false positives associated with EPA Method 6010. The change to EPA Method 6020 appears to have resolved this issue. Table 2-18 summarizes the two years of groundwater monitoring results for benzo(a)pyrene, arsenic, manganese, and total Aroclors.

Surface Water Monitoring

Quarterly surface water monitoring has been conducted during 2007 Rounds 2, 3, and 4 and all rounds in 2008. The validated analytical results were compared to U.S. EPA National Recommended Water Quality Criteria (NRWQC).

Concentrations of five pesticides in 2007 and one pesticide in 2008 exceeded the NRWQC. Four exceedances were present in the sample from location SW03 collected in Round 2-2007. The majority of the detected pesticides in Round 2-2007 were present in samples with elevated turbidities. The detected compounds could be associated with pesticides in soils or sediments that are entrained/suspended in the water samples.

The PCB, Aroclor-1260, was detected only in Round 2-2007, at SW02 and SW03, (both samples with turbidities greater than or equal to 150 NTUs). These detections exceeded the associated NRWQC.

Dissolved aluminum concentrations from SW03 in Round 2 in both years exceeded the NRWQC for aluminum. In 2007, iron was the only dissolved metal, other than aluminum, that was detected above the NRWQC. The NRWQC for iron was exceeded in samples from locations SW01 and SW03. All iron

exceedances were in samples which also had elevated turbidities. The samples with elevated dissolved iron concentrations correlate relatively well with the samples/locations where anaerobic, highly reducing conditions were measured, based on the combination of very low ORPs and low dissolved oxygen, as well as elevated ferrous iron concentrations. Dissolved lead was only detected at a concentration exceeding the NRWQC in the SW03 sample collected during Round 2 (the maximum turbidity sample) in 2007. In general, dissolved lead was detected infrequently and at low concentrations.

Elevated concentrations of dissolved metals in the samples discussed above may be related to the elevated turbidities of the associated samples prior to field-filtering. The most elevated concentrations of metals in surface water are linked to those samples with high turbidity levels. It is likely that these concentrations are, at least in part, resulting from entrained or suspended soils/sediments within the water samples. Given the difficulties experienced in collecting an adequate volume of surface water each quarter, due to small depths of standing water, it is difficult to minimize the amount of entrained or suspended matter in the samples.

Miscellaneous indicator parameters were collected with surface water samples during each monitoring round. Based on the combination of a very low ORP and low DO, as well as elevated ferrous iron concentrations, anaerobic, highly reducing conditions were measured at all three wetland sample locations (SW01, SW02, and SW03) during Round 2-2007, Round 4-2007 (except SW02) and all rounds in 2008. In contrast to the wetland, the river locations (SWU and SWD) had consistently high ORP and DO values, and low ferrous iron concentrations in both years. In addition, fewer analytes have been detected in the river sample locations than in the wetland sample locations, and the river sample concentrations are lower and generally do not exceed the NRWQC.

Sediment Monitoring

Sediment monitoring was conducted in Round 2 2007 (June) and in Round 2 2008 (June). There are no sediment cleanup levels or remedial goals specified in the ROD. Most detected compounds were present at relatively low concentrations. In both years VOCs, SVOCs, VPH, EPH, pesticides, and metals were detected. In 2007 two PCBs were also detected; in 2008 cyanide was also detected. Four of the detected VOCs were also present in at least one surface water location and one groundwater sample location.

Benzo(a)pyrene, a PAH, was detected in all four sediment samples in 2007 and 2008. The highest concentration was reported at SD02 in both years. Benzo(a)pyrene was not reported in any surface water sample, and was detected in just one groundwater sample (2007-Round 1).

Based on VPH and EPH results, petroleum-related contaminants are present in sediments, primarily at SD01 and SD02. Sheens (organic and inorganic) were observed on surface water at both SD01 and SD02; although NAPL was not observed.

The maximum detected concentration of total Aroclors in the sediment samples is approximately 10 times lower than the Phase II RI risk screening value. No PCBs were detected in sediment samples in 2008.

Landfill Gas Monitoring

Landfill gas monitoring has detected several methane-enriched areas at the RDA. Elevated methane readings were recorded at gas probes GP-01 and GP-02, near the northern perimeter of the Site boundary, and at gas probe GP-06 along the western perimeter of the landfill. There does not appear to be any discernable trend in methane concentrations in gas probes. The gas probe methane concentrations are graphically presented in Figure 2-7. Little to no methane was detected in gas probes GP-03, GP-04, and GP-07

At gas vent GV-06, located near the apex of the landfill, percent methane peaked in Round 3-2007 and has been subsequently trending downward for three rounds. Round 3-2008 measurements exhibited an increase in methane levels in GV-04 and GV-06. The gas vent methane concentrations are graphically presented in Figure 2-8.

Small Mammal Tissue Monitoring

Small mammal tissue sample analysis detected four PCB homologs in one sample location, RDA-ET02. RDA-ET02 is located in the area of the former PCB hotspot. The total PCB result for this sample was 320 µg/kg. One PCB homolog was detected in sample RDA-ET03 (0.64 µg/kg). No PCB homologs were detected in sample RDA-ET01. In comparison to the pre-remedial investigation tissue samples, PCB concentrations were significantly lower. The 2008 maximum PCB concentration is more than an order of magnitude lower than the maximum PCB concentration reported in the RI.

Wetlands Inspections

Post-remediation wetland monitoring was conducted in Fall 2007 and Spring and Fall 2008. The current coverage by non-invasive species fell short of the performance standard due primarily to the presence of purple loosestrife. Despite the invasive species controls discussed in the LTMP, herbicide treatment of purple loosestrife is not recommended. Unlike common reed, purple loosestrife is present throughout the vegetation in most areas of the restored and created wetlands. It is not possible to spray the purple

loosestrife without substantially damaging the other vegetation. Furthermore, the natural wetlands adjoining the restored and created wetlands also contain purple loosestrife. Even if the purple loosestrife could be eradicated from the created and restored wetlands, it would be expected to readily reinvade from nearby natural seed sources. However, it is worth noting that during the Spring and Fall 2008 field effort numerous individual purple loosestrife plants were observed to contain defoliating insects and/or damage to the leaf tissue. Two species of beetles in the genus *Galerucella* are commonly used as a biological control for purple loosestrife in both natural and created or restored sites. It is possible that purple loosestrife beetles have been released at other wetland sites in the vicinity of the RDA and have migrated to this site.

Multiple localized patches of common reed are present in the restored wetlands. As presented in the LTMP, treatment of these patches with glyphosate or another suitable post-emergence herbicide, if approved, is recommended. Only herbicide formulations labeled for use in aquatic areas should be used.

Glossy buckthorn is present in the reference wetland and is especially abundant along the boundary with the created and restored wetlands. During the Fall 2008 field effort, numerous glossy buckthorn seedlings were observed within the boundary of created and restored wetlands. Since buckthorn does not re-sprout from underground root systems, extraction efforts will focus on removing the crown and stem. It is recommended that these activities commence during the 2009 monitoring activities.

Despite a slow start, attaining the performance standard regarding tree and shrub recruits appears to be possible by the end of the fifth year. Although only a single shrub seedling was recorded within a monitoring plot, numerous common alder shrubs were observed scattered throughout the created and restored wetlands, outside the plots. There are at least two possible causes for the retarded development of the shrub layer. First, since the tree and shrub seed stock within the original layer of topsoil was completely removed from the remediated site, the only seed source for recruitment is provided by the natural wetlands adjoining the site. Second, the dense emergent vegetation may overshadow and compete with the seedlings. However, due the presence of numerous shrubs during the Spring 2008 and Fall 2008 monitoring efforts, it is recommended that a decision to plant additional tree and shrub seedlings be re-evaluated in 2009 to allow more time for the shrub layer to develop further.

O&M/LTM Costs

The ROD estimated the O&M and LTM costs based on a 30-year groundwater monitoring program. The actual costs after 2 years are higher due to the addition of surface water and sediment monitoring which were not included in the ROD estimate. These additional costs cover the field effort (labor and equipment) and laboratory analyses required for these additional monitoring components. The estimated

costs of the program described in the LTMP and QAPP approximate the actual costs to date for conducting O&M and LTM activities.

The O&M and LTM activities for the landfill continue to be implemented as required.

Opportunities for Optimization.

The primary opportunity for optimization is the reduction in analytical costs associated with long term monitoring by eliminating certain parameters.

For groundwater, the analysis of pesticides and herbicides could be considered for elimination: just three pesticides and one herbicide were detected in groundwater at trace levels, and in just two samples out of a total of 42 samples analyzed. All detections were more than an order-of-magnitude below MCLs/MMCLs, where established.

For surface water, the analysis of herbicides could be considered for elimination: just three herbicides were detected in one surface water sample from one sampling event, SWD-0907; one of these three compounds was also detected at a lower concentration in SWU-0907. NRWQCs are not established for these compounds.

In 2008, the analytical method for the detection and quantitation of the metal, thallium, was changed from EPA Method 6010 to EPA Method 6020. The use of a more sensitive and selective analytical method for thallium provides data that meets the LTM data quality objectives. The 2007 results were likely impacted by interferences in the samples. The use of EPA Method 6020 (ICP-MS) for thallium results in a small additional per sample cost. Thallium was not detected in any of the surface water or sediment samples.

Landfill gas monitoring using field screening instruments has detected several methane-enriched areas at the RDA. Collection of landfill gas samples using SUMMA canisters and laboratory analysis using EPA Method TO-15 should be considered. The field instruments do not provide information as to the types and levels of landfill gases present at the RDA which analytical data will provide.

Indicators of Remedy Problems

No problems with the remedies in place or the ongoing O&M activities were identified during this five-year review.

The data collected during the first 2 years, of a projected 30-year LTM period, indicate conditions reflective of a 'young' landfill. Geochemical changes are expected as the LTM continues and the closed landfill matures. Additional data and landfill gas monitoring are needed prior to assessing the need for any changes to the systems currently in place. Inspections of the restored and created wetlands indicate good progress toward attaining the LTMP performance standards.

Implementation of Institutional Controls

The ROD included implementation of institutional controls to achieve the following land use control performance objectives:

- Prevent human exposure to groundwater containing contaminant concentrations in excess of federal of more stringent state drinking water standards or posing potential risk to humans.
- Prohibit activities or uses of the site that would disrupt or otherwise interfere with the integrity or function of the permeable soil cap. These prohibited activities include construction on, excavation of, or breaching of the permeable soil cap.

Access controls are in place at the RDA. These controls consist of a fence encompassing the landfill cap and warning signs posted in two locations; along the northern perimeter of the landfill and at the main gate area along the western perimeter of the landfill. The landfill inspection noted unauthorized vehicle ruts outside the fence indicating that the fencing and signage are functioning as intended.

The ROD specified that a Land Use Control (LUC) Remedial Design Plan be developed. At the time this review was completed, this plan was in regulatory review. The Navy expects the plan will be implemented upon transfer of the property to the developer.

2.6.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels and Remedial Action Objectives (RAOs) Used at the Time of the Remedy Selection Still Valid?

Changes in Exposure Pathways

No changes in exposure pathways or land use have occurred since the selection of the remedy. The Base redevelopment plans indicate that a new roadway, the East-West Parkway, will be constructed adjacent to the northern perimeter of the RDA landfill cap. Any potential change in exposure pathways will be evaluated prior to construction activities.

Additional measures are now in place to further prevent human exposure to groundwater. The SSTTDC established Health Regulations for NAS South Weymouth on June 5, 2008, which prohibit any potable wells, and establish a permitting process for installation of private wells for non-potable use. The Massachusetts new source approval process for community or public water supply wells requires a proponent to determine the Zone 2 of a pumping well and identify any potential hazards within it. This requirement would prevent new wells from being sited in the vicinity of the landfill or the adjacent wetlands.

Changes in Standards or Newly Promulgated Standards

As the remedial work has been completed, most location-specific and action-specific ARARs for wetland impacts, riverine impacts, hazardous waste disposal, and landfill construction cited in the ROD have been met. Location Specific ARARs that have been reviewed for changes include: the Massachusetts Endangered Species Act (321 CMR 10.00). Action-Specific ARARs that have been reviewed for changes include: Federal Ambient Water Quality Criteria (AWQC) (33 USC 1314(a), (40 CFR Part 122.44); Massachusetts Surface Water Quality Standards (314 CMR 4.00); Massachusetts Solid Waste Management Environmental Monitoring Requirements (310 CMR 19.132); and Massachusetts Solid Waste Management Landfill Post-Closure Requirements (310 CMR 19.142). A list of the ARARs included in the ROD is included in Appendix F. The results of the ARARs review are discussed below.

The Massachusetts Natural Heritage and Endangered Species Program removed the spotted turtle as a 'species of special concern' in 2006. The eastern box turtle remains listed as a 'species of special concern.' All work areas are checked for the presence of turtles prior to commencement of all LTM field activities.

The federal AWQC have been updated and are now referred to as the National Recommended Water Quality Criteria (NRWQC). The NRWQC (2006) are used in evaluating the surface water data from each LTM round. The surface water monitoring data will continue to be compared to the NRWQC to assess any impacts of the site on water quality. No changes were identified to the Massachusetts Solid Waste Management Requirements or the Massachusetts Surface Water Quality Standards. The protectiveness of the remedy has not been affected by the changes to the Massachusetts Endangered Species Program or the federal water quality criteria.

While the RDA ROD does not contain any chemical-specific ARARs tables, EPA has suggested that chemical-specific ARARs are needed. In a September 3, 2008 letter to the Navy, EPA suggested that the addition of chemical-specific ARARs and other modifications to the ROD be addressed through the issuance of an Explanation of Significant Differences (ESD) (EPA correspondence, 2008). EPA

suggested adding a number of EPA risk assessment guidance documents as chemical-specific 'to be considered' ARARs. These guidance documents were used in the CERCLA risk assessment process as presented in the RI. EPA also suggested the addition of Safe Drinking Water Act MCLs and maximum contaminant level goals (MCLGs) as action-specific 'relevant and appropriate' ARARs. As discussed in the ROD, EPA and MassDEP agreed with the Navy that groundwater treatment was not necessary; as such, there was no need for chemical-specific ARARs to be applied to groundwater. The groundwater RAO included in the ROD requires prevention of human exposure to groundwater. This RAO is being achieved by the implementation of institutional controls.

Per the ROD, the LTMP analytical program is based on the parameters included in the Massachusetts post-closure monitoring regulations (310 CMR 19.142). The RGs, MCLs and MMCLs identified in the ROD are being used to evaluate the groundwater analytical results under the RDA post-closure monitoring program. Although groundwater beneath the RDA is not being used as a drinking water supply, groundwater analytical results are being compared to MCL and MMCL criteria in accordance with the LTMP. Since MCLs promulgated under the Safe Drinking Water Act are being used in evaluation of groundwater data obtained consistent with the long term monitoring and the Massachusetts post-closure monitoring regulations and since institutional controls will prevent human exposure to groundwater, an ESD and changes to the ARARs in the ROD are not considered necessary to ensure the protectiveness of the remedy.

Changes in Toxicity and Other Contaminants Characteristics.

The exposure assumptions used to develop the Human Health Risk Assessment (HHRA) included both current exposures (onsite worker, construction worker, and trespasser) and potential future exposures (future resident and future recreational child). According to current toxicity values and the new Oak Ridge National Laboratory (ORNL) screening levels, all toxicity values for arsenic, manganese, and benzo(a)pyrene (for both cancer and non-cancer) are still the same as the ones used in the Phase II RI HHRA, indicating that the risk calculations would not change.

The ecological risk assessment (ERA) that was conducted as part of the Phase II RI was reviewed to determine whether the results of the risk assessment would change based on current criteria and/or methodologies. The screening levels for several chemicals detected in surface soil, sediment, and surface water samples have either been updated or replaced with screening levels from other sources. The changes in screening levels are unlikely to have a significant impact on the results and conclusions of the ERA because site specific toxicity studies and biological studies were conducted as part of the ERA. As indicated throughout the ERA and summarized in Table 7-53 of the ERA, several lines of evidence (i.e., several measurement endpoints) were used to evaluate each assessment endpoint. The

comparison of chemical concentrations to screening levels was only one line of evidence and it was typically given a lower weight than the site-specific toxicity testing, tissue data, and biological studies. The following paragraphs present a brief evaluation for each receptor group.

Risks to plants and invertebrates were evaluated in the ERA by comparing chemical concentrations in soil to plant and invertebrate benchmarks, conducting plant and earthworm toxicity tests, and evaluating earthworm tissue data. USEPA Ecological Soil Screening Levels (Eco SSLs) are currently used as soil screening levels. The ERA did not use any soil screening levels to select chemicals as COPCs, but other values such as the ORNL plant and invertebrate benchmarks (Efroymson et al., 1997 a,b) and Dutch Intervention Values (Van der Berg et al., 1993) were used in the Risk Analysis section of the ERA. Following current ERA guidance, the ORNL and Dutch numbers are typically only used in the risk characterization section of ERAs for chemicals that do not have Eco SSLs. As presented in Table 7-53 of the ERA, several inorganic chemicals were detected at concentrations that exceeded plant and invertebrate benchmarks, but they were given low weighting scores. Earthworm and plant toxicity tests and earthworm tissue burden data endpoints were given greater weights for evaluating impacts to plants and invertebrates because they were site-specific. Based on these site-specific endpoints, the ERA concluded that little to no significant potential risks to terrestrial plants and invertebrates are likely due to exposure to COPCs in RDA. Therefore, even if additional chemicals were retained as COPCs because their concentrations exceed current Eco SSLs, the overall conclusion in the ERA, "no significant potential risks to terrestrial plants and invertebrates," would remain the same based on the site-specific studies that were conducted as part of the ERA.

Risks to small mammals and birds were evaluated in the ERA by conducting standard food chain models, comparing PCB concentrations in small mammal tissue samples collected at the site to critical body ratios (CBRs), and a qualitative field assessment of the small mammal and avian communities in the area. The general approach for food chain modeling used in the ERA is consistent with the approach currently used in risk assessments. However, the toxicity reference values (TRVs) for most metals and a few organic chemicals (primarily DDTs and PAHs) have changed based on recent USEPA Eco SSL guidance, and the body weight scaling that was used to adjust the TRVs in the ERA is no longer standard practice. The majority of the more recent TRVs are ether similar to or greater than the TRVs used in the risk assessment, although some TRVs are now lower. The ERA concluded that although several chemicals had hazard quotients (HQs) greater than 1.0, given the numerous conservative assumptions, the HQs were deemed to be acceptable. Because the HQs would not change significantly for most chemicals based on the new TRVs, it is likely that risks would still be considered acceptable.

Small mammal tissue samples have been collected from three locations as part of the long-term monitoring program for the RDA. The maximum PCB concentration in the mammal tissue samples was

0.3 mg/kg, which is lower than the range of PCB concentrations in the mammal samples collected for the Phase II RI (0.6 to 5 mg/kg). Therefore, the PCB concentrations are lower than the CBRs where reproductive effects may occur, as identified in the ERA. Because of this, risks to small mammals would now be considered acceptable, whereas the ERA concluded that risks to small mammals were possible based on the PCB concentrations in their tissue.

The ERA concluded that little significant potential risks to aquatic invertebrates, amphibians, and fish were likely due to exposure to COPCs in RDA surface water and sediment. This conclusion was based on multiple measurement endpoints. The endpoints that were given the greatest weight were the site-specific toxicity tests and benthic community survey. Other endpoints with lower weights were comparisons of chemical concentrations in surface water and sediment to screening levels, an evaluation of Simultaneously Extracted Metals (SEM)/Acid Volatile Sulfides (AVS) data, and comparison of chemical concentrations in tissue samples to CBRs. The general approach for conducting toxicity tests and biological surveys has not changed significantly since the ERA was conducted, so those results are still considered valid.

Although the EPA Water Quality Criteria have changed slightly since the ERA, most of the current values are the same or very similar to those used in the ERA. In addition, other sediment screening levels may be used in the initial screening step to select COPCs, but the values are similar to what was used in the ERA. As presented in Tables 7-46 and 7-47 of the ERA, several chemicals were detected at concentrations that exceeded surface water and sediment benchmarks, but the ERA concluded that there were little significant potential risks to aquatic invertebrates, amphibians, and fish because of the other endpoints. Also, the SEM/AVS ratio was greater than 1.0 at some locations in the ERA which was used to determine whether certain metals were potentially bioavailable. In 2005, USEPA published the *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Metal Mixtures (Cadmium, Copper, Lead, Nickel, Silver, and Zinc).* This document described an alternative approach to evaluating AVS and SEM data. Re-evaluating the SEM/AVS data would not change the conclusions of the ERA because although this endpoint provided evidence of potential ecological risk in the ERA, other endpoints which were given greater weight indicated that risks were acceptable. Finally, there has been little change in the available CBR data since the ERA was completed, so re-evaluating the CBR data would not change the conclusions of the ERA. In summary, although some of the surface water and sediment screening levels have changed or been updated, and the methodology for evaluating AVS/SEM data has changed, a re-evaluation of the existing sediment and surface water data likely would not result in significant changes in the overall conclusion of the ERA for reasons discussed above.

New surface water and sediment data has been collected the past few years as part of the long-term monitoring program for RDA. Tables 2-11 and 2-12 present the sediment results from the June 2007 and June 2008 sampling events, respectively. The concentrations of organic chemicals in the samples collected in 2007 and 2008 are similar to or lower than the concentrations in the samples used in the ERA (see Table 7-5 in the ERA), with a few additional VOCs detected in the 2007 and 2008 samples. The concentrations of several metals in the 2007 samples were greater than the concentrations in the samples evaluated in the ERA, but the 2008 samples had similar metals concentrations to the data evaluated in the ERA. Tables 2-7 and 2-8 present surface water results from the 2007 and 2008 sampling events. Additional organic chemicals were detected in the 2007 and 2008 samples and the concentrations of several metals were greater in those samples as compared to the samples used in the ERA (see Table 7-6 in the ERA). The reason for the different concentrations between the samples evaluated in the ERA and the 2007 and 2008 samples is not known, but it could be because of differences in sample locations. Nevertheless, the conclusions in the risk assessment were made after giving more weight to the site-specific toxicity tests and the biological studies. For that reason, the presence of additional chemicals in the surface water and sediment, and the greater concentrations of some parameters likely would not change the results of the risk assessment. However, it is recommended that the monitoring of surface water and sediment quality be continued and if increasing trends are observed, the need to re-evaluate the risks assessment be considered.

Changes in Risk Assessment Methods. No changes in risk assessment methods have occurred that have affected the protectiveness of the remedy at the RDA.

Expected Progress Towards Meeting RAOs. The landfill cap construction was completed on December 2, 2005. In addition, wetlands restoration and creation work has been completed. Groundwater, surface water, sediment, and landfill gas monitoring continues as part of the LTM. The analytical results have indicated that manganese concentrations exceeded RGs in 2007 and 2008 and arsenic and benzo(a)pyrene concentrations exceeded RGs in 2007 only. Small mammal tissue PCBs concentrations in 2008 were an order of magnitude lower than those detected during the remedial investigations.

2.6.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No other information was identified during the completion of this five-year review that could affect the protectiveness of the remedy.

2.6.4 Technical Assessment Summary

According to the data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Although ROD-based RGs and ARARs for surface water contamination and landfill gas have not been met, the monitoring established to assess groundwater, surface water, sediment, and landfill gas quality adjacent to the landfill is just 2 years into an anticipated 30-year monitoring period. There have been no changes in the toxicity factors for the contaminants of concern that were used in the HHRA and ERA, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

2.7 ISSUES

This section provides a summary of the issues identified during this five-year review. Recommendations and follow-up actions are presented in Section 2.8.

The upgradient/background wells, MW05 and TT01, dewater quickly and recharge slowly. Using a modified purging and sampling technique, in 1 day there often is insufficient volume in the well to collect the full suite for analysis.

Groundwater concentrations in 9 of the 10 monitoring wells consistently exceeded the ROD based RGs for manganese in both years of monitoring. Manganese is the only analyte with concentrations that have consistently exceeded ROD-based RGs. Exceedances of the RGs and MCLs/MMCLs for other analytes were limited in frequency. The RG for benzo(a)pyrene was exceeded once, at one well during Round 1 2007. The RG for arsenic was exceeded only during 2007. Groundwater contaminant concentrations exceeded MCLs/MMCLs for cadmium (once in 2008), lead (in 2007), and thallium (using the old method, 6010). Aroclor 1254 was detected in groundwater at a concentration exceeding the MCL/MMCL once at one well during Round 1 2007.

Surface water concentrations have exceeded the EPA National Recommended Water Quality Criteria (NRWQC) for six pesticides, Aroclor 1260 (2007 only), aluminum, iron, and lead (2007 only). There were more NRWQC exceedances in 2007 than in 2008.

Landfill gas monitoring with field measuring equipment has noted several areas of elevated levels of methane in gas ports located near the northern and western perimeter of the landfill and a gas vent located near the apex of the landfill.

Landfill repairs and maintenance are required including: repair of vehicle ruts on the landfill; mowing of the vegetated cap; and performance of a settling monument survey.

Invasive species control is needed in the restored and created wetlands for common reed, glossy buckthorn and purple loosestrife. Different methods are required for removal/eradication of the three species.

Land use controls are not yet finalized and implemented for the RDA. GEA needed

There have been no identified changes in action-specific or location-specific ARARs that could affect the protectiveness of the remedy. No chemical-specific ARARs have been identified. ESD

2.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendation/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Afftects Protectiveness ? (Y/N)	
					Current	Future
Background wells have low-yield and poor hydraulic conductivity conditions.	Replace background monitoring wells RDA-TT01 and RDA-MW05	U.S. Navy	EPA/MassDEP	Spring 2009	No	No
Remedial Goals and MCL/MMCL criteria for manganese in groundwater have been exceeded and NRWQC have been exceeded in surface water.	Continue to monitor concentration trends in groundwater and surface water.	U.S. Navy	EPA/MassDEP	Next five-year review	No	No
Landfill gas monitoring has detected elevated levels of methane gas.	Perform landfill gas sampling and compare TO15 analytical results to MassDEP threshold effects exposure limits.	U.S. Navy	EPA/MassDEP	Spring 2009	No	No
Various O&M tasks need to be completed.	Repair tire ruts, southern benchmark, and mow the cap. Conduct landfill settlement survey.	U.S. Navy	EPA/MassDEP	Spring 2009	No	No
Invasive species in restored/created wetlands.	Research control of purple loosestrife using beetles. Use glyphosate on common reed and remove crown and stem of glossy buckthorn.	U.S. Navy	EPA/MassDEP	2009	No	No
Land Use Control Implementation Plan needs to be finalized.	Implement Land Use Control Plan upon transfer of property to land developer.	U.S. Navy	EPA/MassDEP	Upon property transfer	No	No

2.9 PROTECTIVENESS STATEMENTS

The remedy for the RDA is expected to be protective of human health and the environment upon completion of long-term monitoring, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Long-term monitoring is being conducted in accordance with the approved LTMP and QAPP. Contaminant concentrations are consistently below RG levels for two of the

three designated contaminants. Benzo(a)pyrene concentrations have been below RG levels since Round 2-2007 and arsenic concentrations since Round 5-2008. Manganese concentrations have been above RG levels in nine of the ten monitoring wells in all LTM events to date.

Land use controls must be put in place and implemented upon transfer of the property. Continuation of post-closure inspections and maintenance/repairs for the landfill area cap are required to ensure the remedy remains protective. Long-term monitoring must continue consistent with EPA and MassDEP approved Final Long-Term Monitoring Plan (TtEC, 2008) and the Final Quality Assurance Project Plan for Long-Term Monitoring (TtNUS, 2007) and approved modifications. Long-term monitoring data must be evaluated annually to ensure the remedy remains protective of human health and the environment.

2.10 NEXT REVIEW

A second five-year review for RDA and other CERCLA sites at NAS South Weymouth will be completed in 2014.

3

3.0 OTHER CERCLA SITES

This section includes a description of the IR sites and Areas of Concern (AOCs) at the Base which are being investigated under the CERCLA remedial process. The sites are grouped into 'active sites,' where investigations are on-going or a ROD is in place but the selected remedy has not yet been implemented; and 'closed sites,' where investigations are complete and either a No Action or a No Further Action ROD is in place. The locations of the sites discussed in this section are shown in Figure 3-1. Two IR sites, the Former Fuel Farm (IR Site 6) and the U.S. Coast Guard Buoy Depot, are not discussed in this section. The Former Fuel Farm was removed from the IR Program in 1994 and addressed under the Navy's Underground Storage Tank Program. The site was closed under the Massachusetts Contingency Plan (MCP) in 2002. The U.S. Coast Guard leased the Buoy Depot site from the Navy from March 1972 until October 2000, when the Navy transferred the property to the Coast Guard. At the time of transfer, the U.S. Coast Guard assumed responsibility for the CERCLA investigation at the Buoy Depot site. The U.S. Coast Guard and EPA signed a ROD in 2006; the remedy has been implemented and long-term monitoring and operations and maintenance are underway.

3.1 ACTIVE SITES

The active sites include three IR sites where the ROD-specified remedy has not yet been implemented; three IR sites where remedial investigations are on-going; and four AOCs where investigations are on-going. Remedies have not yet been selected at the IR and AOC sites in the investigation phase. The table below indicates the active sites discussed in this section.

Navy Designation	EPA Designation	Site Name	Report Section
IR Site 1, OU-1	OU1	West Gate Landfill	3.1.1
IR Site 3, OU-3	OU3	Small Landfill	3.1.2
IR Site 7, OU-7	OU7	Former Sewage Treatment Plant	3.1.3
IR Site 9, OU-10	OU9	Building 81	3.1.4
IR Site 10, OU-11	OU11	Building 82 (Hangar 2)	3.1.5
IR Site 11, OU-12	OU14	Solvent Release Area	3.1.6
AOC Hangar 1	OU25	Hangar 1	3.1.7
AOC 14	OU23	Water Tower Staining	3.1.8
AOC 55C	OU22	North of Trotter Road – Pond Area	3.1.9
AOC 83	OU24	Hazardous Waste Storage Area	3.1.10

3.1.1 IR Site 1 – West Gate Landfill

IR Program Site 1, the West Gate Landfill (WGL), comprises approximately 5.23 acres located near the mid-point of the western border of the Base. The WGL was an active landfill from the 1940s until 1972; prior to that time, it was a swamp. Due to insufficient information regarding the nature of materials that were disposed at the WGL, it was assumed that all types of waste from the Main Base went to the landfill during the period of its use. Materials noted during the investigations summarized below include metal, asphalt, bricks, concrete, plastics, wires, bottles, cans, rubber tubes and hoses, and other debris. Most of the area that comprises the WGL is now overgrown with brush and trees. The approximate fill thickness is 10 feet; the volume of fill is estimated at approximately 85,000 cubic yards.

During the Site Inspection (SI) and RI, the Navy conducted geophysical studies to identify the extent of the disposal area, and collected soil, groundwater, sediment, and surface water samples. Tissue sampling, toxicity testing, and a benthic macro-invertebrate community survey were used to further characterize the ecology of the site. No subsurface soil samples exhibited characteristics that would cause them to be classified as a hazardous waste under the Resource Conservation and Recovery Act (RCRA). Several compounds including PAHs, PCBs, dioxins, arsenic, chromium, lead, and mercury were detected at levels exceeding background, primarily in surface soil. These compounds contributed to exceedances of human health risk thresholds for all exposure scenarios assessed and exceedances of ecological risk thresholds for terrestrial invertebrates and wildlife receptors. The Final RI was issued in April 2002.

A Feasibility Study (FS) completed in January 2003 evaluated remedial alternatives to reduce or eliminate potential exposure to chemicals of concern (COCs) on the surface of the landfill. The Navy issued the Proposed Plan in May 2007. The Proposed Plan included constructing a soil cover over the landfill, long-term monitoring, and institutional controls. The Record of Decision (ROD), which documents the selected remedy (soil cover, long-term monitoring and institutional controls), was signed by the Navy on September 21, 2007 and the EPA on September 28, 2007. MassDEP issued a letter of concurrence dated September 28, 2007. A pre-design investigation is underway and will provide information for use in the design of the remedy for the site which is now underway. The remedial design will then be completed, followed by implementation of the remedial action, including the required institutional controls.

3.1.2 IR Site 3 – Small Landfill

IR Program Site 3, the Small Landfill (SL), is an approximately 0.8-acre inactive landfill located east of the Old Swamp River. The SL received concrete rubble and tree stumps for a brief period of time ending in the mid-1980s. The landfill is approximately 9 feet deep and contains an estimated 12,000 cubic yards

of fill. Materials found during the investigations included aluminum, steel, rubber tubing, metal pipes and rods, bottles and cans, electrical wires, concrete, boulders, wood debris, asphalt, railroad ties, and plastic materials. The surface of the site is uneven, with patches of trees, shrubs, and grass.

The Navy collected soil and groundwater samples and conducted geophysical studies during the SI and RI to identify the extent of the SL, characterize surface soil, confirm groundwater flow direction, and provide data for an ecological characterization. Concrete and other debris were observed in test pits and boreholes to a depth of approximately 12 feet. No subsurface soil samples exhibited characteristics that would cause them to be classified as a RCRA-hazardous waste. Compounds were reported in soil and groundwater at low levels, generally near the analytical method detection limits and typically at levels similar to background conditions at the Base. The human health and ecological risk assessments concluded that cleanup of environmental media was not warranted based on potential exposure to these compounds. Since no CERCLA risks were identified, an FS was not required.

The Navy issued a Proposed Plan for No Action with Groundwater Monitoring in April 2001. The ROD was signed by the EPA and Navy, with MassDEP concurrence, in March 2002. The ROD specified No Action with groundwater monitoring under CERCLA and required closure of the landfill under applicable state law. The required groundwater monitoring was completed in 2002. The Navy submitted a Corrective Action Design, which follows the substantive requirements of the Massachusetts Solid Waste Regulations, to the MassDEP Office of Solid Waste in January 2008. The landfill will be closed following approval of the Corrective Action Design.

3.1.3 IR Site 7 – Former Sewage Treatment Plant

IR Program Site 7, the former Sewage Treatment Plant (STP), comprises approximately 3.2 acres located in the northern portion of the Base. The site includes the former STP itself, an adjacent former Tile Bed Area (leaching field), and some of the adjacent wetland area. The Tile Bed Area (0.9 acres) was installed in the 1940s and received treated wastewater for final treatment (filtration, biodegradation) and disposal. The STP adjacent (north) to the Tile Bed Area was constructed in 1953 and used as the wastewater treatment facility for the Base until 1978. Use of the Tile Bed Area was discontinued in 1953.

The wastewater treated by the plant was primarily comprised of wash water from drains, restrooms, and sanitary sewer inlets. The treated wastewater was directed to an outfall located along the northwest corner of the STP, and flowed through drainage ditches which eventually discharged to French Stream. During the plant's 25-year operation, a number of upgrades were completed, including the expansion of the secondary treatment system (trickling filter and secondary settling tank) and the installation of a simple aerobic digestion system and drying beds to treat the wastewater sludge. The Navy obtained a

National Pollutant Discharge Elimination System (NPDES) permit in 1975, for the discharge of treated wastewater to French Stream. In 1978, the STP was dismantled and wastewater from the Base was connected to the municipal sanitary sewer system. The tanks and associated structures of the STP were removed in 1992.

During the RI, soil, groundwater, surface water, and sediment samples were collected and human health and ecological risk assessments were performed. There were no exceedances of human health risk thresholds for current site use. However, human health risk thresholds for future site use scenarios (residential and recreational) were exceeded due to concentrations of dieldrin in surface soil, arsenic in groundwater, and/or PCBs in surface water. Ecological risk thresholds were exceeded, primarily due to the concentrations of DDT, DDD, DDE, and arsenic in sediment (hydric soil). The Final RI Report was submitted in April 2002.

A supplemental sampling event to collect soil samples from the former sludge drying bed area was performed in 2006. The Final FS, Revision 1 was issued in April 2007. Navy issued the Proposed Plan in August 2007. The Proposed Plan included excavation of contaminated soil and sediment followed by off-site disposal or recycling by asphalt batching.

The ROD which documents the selected remedy (excavation of contaminated soil and sediment followed by off-site disposal or recycling by asphalt batching) was signed by the Navy on April 7, 2008 and the EPA on April 20, 2008. MassDEP issued a letter of concurrence dated April 17, 2008. A pre-design investigation has been completed and a draft final report issued in January 2009. This information will be used in the design of the remedy for the site. The remedial design will then be completed, followed by implementation of the remedial action.

3.1.4 IR Site 9 – Building 81

IR Program Site 9, Building 81, the Marine Air Reserve Training Building and former vehicle maintenance garage, is located in the central building area of the Base. The Building 81 site initially contained a 500-gallon UST for the storage of waste oil. The UST, associated piping, and a small quantity of surrounding soil (estimated at less than 30 cubic yards) were removed in 1991.

The site was originally investigated under the MCP program due to releases from the former UST. A series of assessment activities were performed to investigate evidence of a release from the UST. In 1994, approximately 170 cubic yards of soil were excavated from the vicinity of the UST. After light non-aqueous phase liquids (LNAPL) were detected in a monitoring well, an additional 500 cubic yards of soil were removed from the area in 1998. According to post-excavation documentation provided under the

MCP program, the LNAPL and associated petroleum-impacted soil were successfully removed. However, in addition to petroleum-related compounds, chlorinated VOCs were detected in groundwater at the site at concentrations of up to 1 part per million.

An in-situ chemical oxidation (ISCO) pilot study was conducted in 2000-2001 to assess whether concentrations of chlorinated and other VOCs in groundwater could be significantly reduced. The test involved injection of chemical oxidant into 20 overburden wells and 31 bedrock wells during two ISCO injection events conducted in October 2000 and March 2001. The ISCO treatment zone extended from the UST source area to the western end of the Building 81 footprint. The ISCO treatment program was somewhat effective in reducing the concentrations of petroleum-based compounds in Site groundwater and less effective in reducing the concentrations of the chlorinated VOCs.

Once the ISCO pilot test was complete, due the continued presence of chlorinated VOCs in the groundwater, the site was moved to the IR program. Under the IR Program, the Navy used the ISCO results, combined with the analytical data compiled from the MCP program investigations, to characterize the Building 81 site and develop an RI Work Plan under CERCLA. The RI field program was completed in December 2006.

The draft RI Report, issued in May 2008, assessed the nature and extent of contamination in soil and groundwater at the Site. The predominant contaminants present are VOCs in groundwater. A dissolved VOC contaminant plume at the Site extends from the vicinity of the former UST, approximately 300 feet west-southwest, across Shea Memorial Drive toward the Transportation Building. The highest concentrations of VOCs are present in the deep overburden and shallow bedrock zones, and the extent of the plume is the greatest in these zones. Tetrachloroethene (PCE) is the most frequently detected compound in groundwater and is present at the highest concentrations. The draft RI Report concluded that there were no human health risks from contaminants in soil but identified potential unacceptable risks for future residents from use of groundwater as drinking water and for future construction workers from inhalation of volatile contaminants in trench air. There were no ecological receptors identified at the site; therefore an ecological risk assessment was not performed.

Once the RI Report is finalized, an FS is required to evaluate alternatives to address the potential unacceptable human health risks. The Navy's preferred remedial alternative will be presented in a Proposed Plan. The selected remedy will be documented in a ROD for the site.

3.1.5 IR Site 10 – Building 82 (Hangar 2)

IR Program Site 10, Building 82 (Hangar 2) is located in the central building area of the Base. In September 1998, a removal action was conducted as part of Base closure activities. The removal action

included emptying and cleaning the floor drain systems and gas trap manholes, and disassembling, cleaning, and removing the oil-water separator (OWS). Petroleum-related compounds detected in the vicinity of one of the gas trap manholes in excess of MCP Reportable Concentrations for S-1 soils led Navy to notify MassDEP under the MCP.

Additional investigations conducted under the MCP program identified the floor drain system as a possible source of contamination. The Navy then removed the four floor drain systems to the extent possible, without removing piping from below weight-bearing structures. Once the floor drain systems were removed, the soils beneath the floor drains were sampled. At that point, the EPA and MassDEP directed the Navy to cease activities under the MCP program and continue activities under the IR program consistent with CERCLA. In 2003, the Navy performed a limited due diligence site assessment which included seismic refraction work outside the building; two levels each of ground-penetrating radar and terrain ground conductivity; subsurface soil sample collection under and outside of the hangar; and installed and sampled eight monitoring wells.

An RI Work Plan was prepared; the RI field activities were completed in December 2006. The draft RI Report, issued in November 2007, assessed the nature and extent of contamination in soil, groundwater, surface water, and sediment. Generally low concentrations of VOCs, SVOCs, pesticides, PCBs, and metals were detected in site soil, groundwater, surface water, and sediment. A human health risk assessment evaluated potential risks from contaminants in soil, groundwater, and drainage ditch sediment and surface water at the Building 82 Site. The draft RI risk assessments identified potential unacceptable risks for future residents, primarily from use of groundwater as drinking water, and for future construction workers from inhalation of dust and inhalation of volatile contaminants in trench air. In addition, ecological risks to terrestrial plants and invertebrates, sediment invertebrates, aquatic organisms, and terrestrial receptors at the Site were evaluated and the draft RI concluded that the ecological risks do not warrant further evaluation.

Once the RI Report is finalized, an FS is required to evaluate alternatives to address the potential unacceptable human health risks. The Navy's preferred remedial alternative will be presented in a Proposed Plan. The selected remedy will be documented in a ROD for the site.

3.1.6 IR Site 11 – Solvent Release Area

IR Program Site 11, the Solvent Release Area (SRA), is located in the northeast portion of the Base. Investigations began based on the detection a trace level of PCE (below regulatory standards) in a background subsurface soil sample. Additional field investigations, including a geophysical investigation

and source delineation, led to the site being moved to the IR Program and identified as the SRA in early 2005.

An RI Work Plan was prepared; the RI field activities were completed in January 2007. Soil, groundwater, surface water and sediment samples were collected to determine the nature and extent of contamination at the site. The draft RI Report was issued in September 2008. The draft RI risk assessments concluded that contaminants in site media do not pose unacceptable human health or ecological risks under current exposure scenarios. However, groundwater at the Site contains several organic contaminants and metals at concentrations that may pose unacceptable human health risks to future residents who use groundwater as drinking water. Additionally, potential unacceptable risks to future construction workers were identified from ingestion, dermal contact and inhalation of volatile organics in a future construction trench and from exposure to elevated concentrations of vanadium in soil (dust).

Once the RI Report is finalized, an FS is required to evaluate alternatives to address the potential unacceptable human health risks. The Navy's preferred remedial alternative will be presented in a Proposed Plan. The selected remedy will be documented in a ROD for the site.

3.1.7 Hangar 1 – Floor Drain System

Hangar 1 is located at the intersection of Shea Memorial Drive and Cummings Road. Hangar 1 was the main hangar originally used to house dirigibles and was renovated to store and maintain airplanes.

Various removal actions performed at Hangar 1 included cleaning and hydrostatically testing two floor drain systems. The testing indicated that the system was damaged; the Navy removed the two floor drain systems. Confirmatory samples collected from the base of the trench beneath the former floor drain systems identified chemicals at concentrations greater than MCP reportable concentrations (RCS-1) at several locations.

Soil removals were conducted at the locations where PCB and naphthalene exceedances were detected during the confirmatory sampling. A total of 104.58 tons of PCB contaminated soils were removed and shipped off site for disposal. Confirmatory sampling results indicated no analytes were detected above MCP RCS-1, and no further soil removal was required. The excavations were backfilled with clean soil. Groundwater samples were collected and the results were evaluated for human health risks. The Navy determined that there were no impacts to groundwater and recommended no further action for groundwater.

The close out of the Hangar 1 floor drain system is pending the resolution of various technical issues. The Navy plans to prepare a No Further Action Proposed Plan and ROD following issue resolution and revision and acceptance of removal action reports.

3.1.8 Area of Concern 14

AOC 14 encompasses the area along two railroad spurs that brought supplies to the Base beginning in the 1940s. The site includes an area where drums had been stored along the railroad spurs. Potential staining visible on aerial photographs suggested that spills may have occurred along the spurs. Surface soil, subsurface soil, and groundwater samples were collected in the area where materials were stored and possibly spilled.

A streamlined human health risk assessment was conducted to evaluate the potential for risks to human health from exposures to chemicals at or originating from the site in accordance with CERCLA risk assessment guidance. The human health risk assessment evaluated PAH and lead in soil and determined that the risks were within EPA's acceptable risk range. The risk associated with lead was further reduced because the Navy removed the soil containing elevated lead levels as part of the removal action for AOC 15, the water tower. There were no ecological receptors identified at this site. The Navy issued a Draft No Action Proposed Plan on March 29, 2006. Further progress on this site is on hold pending resolution of MassDEP issues.

3.1.9 Area of Concern 55C

AOC 55C is located in the Town of Weymouth west of Perimeter Road. The site includes a small pond and adjacent wetland and is approximately 0.4 acres. Metallic debris was observed scattered throughout this area, with a large percentage of debris around the perimeter of the pond. The site is an undeveloped parcel; most of the area is a delineated isolated wetland which appears to have been historically disturbed by filling and dumping. A potential vernal pool area (which has not been classified as a "certified vernal pool" by the State of Massachusetts) has been identified within the wetland.

Surface soil, subsurface soil, sediment, and surface water samples were initially collected. Additional field work (soil borings and surface water and sediment sampling) was subsequently performed to delineate the extent of contamination. Evaluation of the data indicated possible ecological impacts. Prior to completing a planned removal action, EPA suggested a further evaluation of the area, including a wetlands functions and values assessment and toxicity testing. The Navy agreed with EPA's suggestions, and performed an ecological risk field program and assessment.

The ecological risk assessment performed in 2007 evaluated surface soil, sediment, and surface water data as well as sediment and surface water toxicity test results. The risk assessment concluded that there are potential risks to terrestrial plants and invertebrates, and sediment invertebrates. No significant risks were identified to fish, aquatic invertebrates, or amphibians from chemicals in surface water or to mammals and birds from chemicals in soil, sediment, or surface water.

A human health risk assessment was performed in 2008 using the same soil, sediment and surface water data set. Potential unacceptable cancer risks were identified to future residents exposed to soils and sediments. No human health risks were identified from exposure to surface water.

Once the risk assessments are finalized, the Navy plans to prepare an engineering evaluation and cost analysis (EE/CA) to select an appropriate removal action. Following the successful completion of the removal action, the Navy plans to prepare a No Further Action Proposed Plan and ROD.

3.1.10 Area of Concern 83

AOC 83 is the former RCRA 90-day hazardous waste accumulation area located on Shea Memorial Drive between Building Nos. 131 and 2. The 90-day hazardous waste accumulation area consists of an approximately 2,400 square foot concrete pad that is covered by a supported roof (which overhangs the concrete pad by more than 2 feet) and a fire suppression system. This area is surrounded by a chain-link fence.

From 2000 to 2003 Navy collected surface soil and subsurface soil samples as well as concrete samples from AOC 83. Elevated levels of PCBs were detected during the 2000 sample round. The Navy prepared a streamlined human health risk assessment which determined that there are no unacceptable risks to human health from exposure to surface soil and subsurface soil at AOC 83.

A Draft No Action Proposed Plan was issued on March 29, 2006. Further progress is on hold due to MassDEP issues.

3.2 COMPLETED SITES

The completed, or closed, sites include 3 IR sites with No Action RODs and 14 AOCs with either No Action or No Further Action RODs. Since there are no cleanup actions required and no unacceptable risks at these sites, five-year reviews are not required. The table below indicates the completed sites discussed in this section.

Navy Designation	EPA Designation	Site Name	Report Section
IR Site 4, OU-4	OU4	Fire Fighting Training Area	3.2.1
IR Site 5, OU-5	OU5	Tile Leach Field	3.2.2
IR Site 8, OU-8	OU8	Abandoned Bladder Tank Fuel Storage Area	3.2.3
AOC 3	OU15	Suspected TACAN Disposal Area	3.2.4
AOC 4A	OU19	Air Traffic Control Area – Abandoned Septic System	3.2.5
AOC 8	OU16	Wyoming Street Area – Building 70	3.2.6
AOC 13	OU15	Supply Warehouse	3.2.7
AOC 15	OU15	Water Tower	3.2.8
AOC 35	OU13	Former Pistol Range	3.2.9
AOC 53	OU17	Former Radio Transmitter Building Area	3.2.10
AOC 55A	OU12	North of Trotter Road – Antenna Field	3.2.11
AOC 55B	OU12	North of Trotter Road – Debris Area	3.2.12
AOC 55D	OU18	North of Trotter Road – Wetland Area	3.2.13
AOC 60	OU20	East Mat Drainage Ditch	3.2.14
AOC 61	OU21	TACAN Outfall and Associated Areas	3.2.15
AOC 100	OU15	East Street Gate Area	3.2.16

3.2.1 IR Site 4 – Fire Fighting Training Area

IR Program Site 4, the former Fire Fighting Training Area (FFTA), comprises approximately 3.8 acres located south of Runway 8-26 and east of Taxiway C. This site currently consists of a cracked asphalt pad and concrete containers (burn pits), which were installed in 1988. Fire fighting training operations began at Site 4 in the mid-1950s. Prior to 1986, waste oil and other fuels were placed in old vehicles and burned. In 1988, concrete burn pits were installed to contain jet fuel; the fuel was ignited and then extinguished to provide fire fighting practice. Reportedly, the only spill or release to the pad would have occurred if water or foam splashed out of the containers during training.

For the SI and Phase I RI, the Navy collected surface water, sediment, soil, and groundwater samples and conducted geophysical studies to identify the extent of contamination at the FFTA. The Phase II RI focused on sample locations south of the FFTA adjacent to the east branch of French Stream and the site to ensure it had been properly characterized. No subsurface soil samples exhibited characteristics that would cause them to be classified as a RCRA-hazardous waste. There were no exceedances of human health or ecological risk thresholds for the current and future use scenarios that were evaluated. The Final RI Report was submitted in April 2001.

At the request of the MassDEP, test pits were excavated and sampled in April 2002 to investigate the potential presence of petroleum residuals. Residual petroleum staining was present immediately below the existing asphalt surface. Analytical results indicated that the stained material had similar properties to

petroleum constituents associated with the existing asphalt. The EPA and Navy concluded that no action under CERCLA was warranted to respond to the petroleum staining. A No Action Proposed Plan was issued in September 2003. The Navy and EPA signed the ROD in September 2004 that specified No Action under CERCLA.

In response to a Notice of Responsibility received from MassDEP in November 2004, the Navy addressed the petroleum residuals at the site pursuant to the MCP. Petroleum-impacted soils were removed and confirmatory samples collected during an MCP Release Abatement Measure (RAM) performed by the Navy from 2005 to 2007. A number of removals were required to achieve the MCP cleanup goals. The Navy submitted a RAM Completion Report and Response Action Outcome (RAO) in July 2008. MassDEP approved the RAO on August 1, 2008.

3.2.2 IR Site 5 – Tile Leach Field

IR Program Site 5, the Tile Leach Field (TLF), comprises approximately 0.3 acres located in the southwest part of the Base along a drainage ditch. The TLF was in active use from 1945 until its closure in 1956. Available information indicated that the leach field may have received battery acid wastes, which likely contained lead.

Surface water, sediment, groundwater, and soil samples were collected as part of the SI and Phase I RI. The Phase II RI further investigated subsurface soil, groundwater, surface water, sediment, and ecological conditions. No subsurface soil samples exhibited characteristics that would cause them to be classified as a RCRA-hazardous waste. The risk analyses indicated no exceedance of human health risk thresholds for all exposure scenarios that were assessed (current and future use). Similarly, there were no exceedances of ecological risk thresholds for the receptors that were assessed. The Final RI Report was submitted in May 2002. Since no risks were identified, an FS was not performed.

An additional focused groundwater investigation was conducted in April 2005 to address concerns about the 1, 4-dioxane results reported in the Phase II RI. The Navy issued a No Action Proposed Plan in October 2005. The Navy and EPA signed the Final ROD in May 2006 that specified No Action under CERCLA. MassDEP provided a letter of concurrence dated April 27, 2006.

3.2.3 IR Site 8 – Abandoned Bladder Tank Fuel Storage Area

IR Program Site 8, the Abandoned Bladder Tank Fuel Storage Area (ABTFSA), comprises approximately 0.46 acres located northwest of Building No. 82 (Hangar 2). From approximately 1982 to 1987, the site was used for the temporary storage of JP-5, a type of aviation gasoline. The fuel was stored in four

10,000-gal fabric bladders (tanks) contained within an earthen berm. The tanks were used to support refueling operations for active aircraft.

Soil, sediment, groundwater, and surface water samples were collected as part of the SI and Phase I RI. The Phase II field investigations focused on the south-southwestern regional flow direction and further characterization of surface soil, subsurface soil, groundwater, surface water, sediment, and ecological conditions. There is no documentation or evidence from the investigations of any past fuel releases at the site.

The sampling results were generally consistent with background levels. Very few compounds (primarily PAHs) were reported in excess of background conditions. No subsurface soil samples exhibited characteristics that would cause them to be classified as a RCRA-hazardous waste. No unacceptable human health risks were identified except for a slight risk to hypothetical future residents consuming aluminum and manganese from site groundwater. However, the presence of aluminum and manganese in groundwater was consistent with regional conditions, and the calculated risks did not exceed risks associated with background concentrations. No significant ecological risks were identified at the site. The RI report was finalized in March 2002.

The Navy issued a No Action Proposed Plan in October 2002. The Navy and EPA signed the No Action ROD in May 2003. MassDEP provided a letter of concurrence with the No Action decision, dated March 21, 2003.

3.2.4 Area of Concern 3

AOC 3, the Suspected TACAN Disposal area, is defined as the area bordered by Runway 8-26, Runway 17-35, and Taxiway C, and is situated in the central portion of the Base. AOC 3 is located east of the TACAN outfall headwall and northwest of the Jet Engine Test Stand. AOC 3 included a mound (soil pile) containing soil, debris, wood, and metal waste in a grassy field near the TACAN outfall. The mound was approximately 20 feet long and 10 feet wide at its base and about 4 feet high. Soil samples were collected from the area and, based on the PAH concentrations, the Navy removed the mound and adjacent soil. Confirmatory sampling indicated that the cleanup goals were achieved and no significant risk remained to human health or the environment.

A No Further Action Proposed Plan was issued in October 2005. The Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in May 2006.

3.2.5 Area of Concern 4A

The AOC 4A, Air Traffic Control (ATC) Area - Abandoned Septic System, investigations focused on potential leaching of material from a septic system that serviced the control tower. The control tower was built in the early 1950s and was in service from the time of its construction until autumn of 1996. In 1999, an inspection and sampling of the septic system was conducted; tank contents (solids and liquid) were sampled and analyzed. Various metals, benzene, chlorobenzene, and some PAHs were detected in the septic system samples. Surface soil, subsurface soil, groundwater, and sediment samples were collected at AOC 4A and the adjacent wetland between 1998 and 2003.

The surface soil, subsurface soil, groundwater, and sediment data collected during the sampling events were used to evaluate potential human health risks at the site. The human health risk assessment determined that there were no unacceptable risks. In July 2004, an ecological risk assessment was conducted; no unacceptable risks to ecological receptors were identified from potential exposure to surface soils and sediment.

A No Action Proposed Plan was issued in June 2007. The Navy and EPA, with MassDEP concurrence, signed a No Action ROD in December 2007.

3.2.6 Area of Concern 8

AOC 8, the Wyoming St. Area – Building 70, consists of the former location of Building No. 70, the Radio Receiver Building. The site is located in a remote part of the southeastern portion of the Base. Building 70 was used during the 1940s and 1950s when the Base was used for Lighter Than Air Aircraft. The building contained electrical equipment used to support an antenna field and was reportedly burned as a fire fighting exercise. Reports also indicated that electrical equipment may not have been removed prior to burning the structure.

Surface soil, subsurface soil, and groundwater samples were collected during a number of sampling events to characterize the site. The results indicated that soils were contaminated with PCBs. A PCB clean up goal was established. Following a number of removal actions to excavate the full extent of the contaminated soils, post-excavation confirmatory samples indicated that the clean up goals were achieved. Approximately 1,534 tons of soils were removed for off site disposal. Wetland areas disturbed during the removal actions were restored.

A No Further Action Proposed Plan was issued in June 2007. The Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in January 2008. Post-remediation wetland monitoring is ongoing.

3.2.7 Area of Concern 13

AOC 13, the Supply Warehouse Railroad Spur, includes the area immediately surrounding the north side of Building No. 2, the supply warehouse, where a rail spur abuts the building. The site is located in the central portion of the Base. The rail spur adjacent to the supply warehouse provided access to the building for delivery of all hazardous and nonhazardous materials used on Base for nearly 20 years. The site is encompassed by pavement, with the exception of the area immediately around the supply warehouse. Small patches of grasses and woody plants are found sporadically within the paved areas.

Soil and groundwater samples were collected. PAHs and hydrocarbons were identified in the soils; no contaminants of concern were identified in groundwater. Soils at two locations were excavated in 2001 and soil samples were collected from the bottom of the excavations to confirm that none of the contamination remained at concentrations exceeding soil target cleanup levels. The Navy collected addition subsurface sidewall confirmatory samples in early 2004 to support resolution of regulatory comments. Based on the results, the Navy excavated a larger area in September 2004. Confirmation samples were collected within the sidewalls and base of the excavation. Approximately 45 tons of soil were excavated during the two removal actions. Target cleanup levels were achieved and thus no unacceptable risk to human health or the environment remained.

A No Further Action Proposed Plan was issued in October 2005. Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in May 2006.

3.2.8 Area of Concern 15

AOC 15, the Water Tower, consists of a grassy area underneath and around the Water Tower. Site surveys identified the possibility that lead paint in soil was a site concern. The Navy conducted removal actions to reduce lead levels in soil surrounding the base of the tower. Approximately 384 tons of lead-contaminated soil was removed from AOC 15 and the adjacent site, AOC 14. Confirmatory samples were analyzed for total lead. The confirmatory sample lead results all were below the MCP Reportable Concentration (RC) S-1 of 300 ppm. Therefore, no additional removal operations were required and the excavation was backfilled.

A ground-water assessment was conducted to confirm that lead–contaminated soil at AOC 15 had not affected ground water. The concentrations of chemicals in the groundwater were determined to be representative of background conditions and/or are not considered to be a potential threat to human health. Based on these results, no further action was recommended for this site.

A No Further Action Proposed Plan was issued in October 2005. The Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in May 2006.

3.2.9 Area of Concern 35

AOC 35, the Pistol Range, is comprised of approximately 2 acres located in the central portion of the Base and north of the East Mat. The site formerly contained small buildings and a large earthen embankment which doubled as a pistol range backstop and de-armament embankment as a safety precaution for aircraft parked on the East Mat. The Navy has removed the buildings and de-armament embankment.

In June 2000, the Navy completed a CERCLA Time-Critical Removal Action (TCRA) to address soil that contained elevated concentrations of lead (from past Pistol Range operations) through excavation and off-site disposal. Post-excavation soil sampling results confirmed that the cleanup goal was achieved and that lead concentrations in soil were below EPA's risk-based screening criterion for unrestricted use. In December 2003, the Navy completed the removal of the site's earthen "de-armament embankment" and disposed the soil offsite. The Navy found no record that arms from aircraft were ever discharged to the embankment, and through its investigations, the Navy found no evidence that unexploded ordnance (UXO) or munitions-related compounds were present. Post-excavation soil sample results for other constituents were within acceptable levels for unrestricted use. The presence of VOCs in groundwater at AOC 35 was attributed to an upgradient site, IR Site 11 (SRA), and not to AOC 35 itself.

The Navy issued a No Further Action Proposed Plan in September 2004. The Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in February 2005.

3.2.10 Area of Concern 53

AOC 53, the Former Radio Transmitter Building, covers approximately 5.7 acres and includes a large open field that is the former location of the Radio Transmitter Building (Building No. 33). The building was likely demolished between 1978 and 1993 and may have housed PCB-containing equipment. Interviews with Base personnel indicated that liquid and solid waste was buried in the vicinity of former Building No. 33.

Two surface soil, subsurface soil, groundwater, sediment, and surface water sampling rounds were conducted at AOC 53. Test pits were completed to investigate subsurface soil conditions. Sediment samples were collected in the nearby stream, Old Mill Stream. The results were evaluated and indicated potential risks to human health and the environment. Removal actions were completed at two locations: approximately 1,181 tons of petroleum-contaminated soil were removed from the Building 33 foundation; and 118 tons of sediment with elevated concentrations of metals and PAHs were removed from the Old Mill Stream bed. Multiple rounds of excavation were required to remove the contaminated soil and sediments to below the target cleanup levels. Following completion of the excavations, the soil data were used in further risk evaluations which determined that there was no unacceptable risk to human health or the environment.

The Navy issued a No Further Action Proposed Plan in June 2007. The Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in December 2007.

3.2.11 Area of Concern 55A

AOC 55A is located west of Calnan Road, north of Trotter Road and along (east of) the Base property fence line. The antenna field contained seven towers that were associated with the Radio Transmitter Building (Building No. 78). The antennas were creosote-treated wooden poles with support wires; each was surrounded by a grounding system with a radius of 35 to 91 feet around each pole. The poles and much of the grounding system wires and rods have been removed from the approximately 11 acre site.

Sediment and surface soils samples were collected; PAHs and metals were detected in the samples. These data were used to support the streamlined human health and ecological risk assessments. There were no unacceptable human health risks identified at the site. Potential unacceptable ecological risks were identified to ecological receptors in surface soil and sediment The Navy removed the antenna poles, and the contaminated soils and sediment around the base of the poles. The post-excavation samples indicated that no unacceptable ecological risk remained. The Navy issued a No Further Action Proposed Plan in August 2003. The Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in October 2003.

3.2.12 Area of Concern 55B

AOC 55B extends north of the current Radio Transmitter Building (Building No. 78) to the area south of the former Radio Transmitter Building (AOC 53) and the Main Gate. The site is an approximately 10 acre

area of solid waste debris containing concrete debris with rebar, some rusted 55-gal drums, tires, shoes, and other household and automotive debris. The Navy removed the surficial solid waste and debris.

Surface soil, subsurface soil, groundwater, and surface water samples were collected during various investigations. The sample results were used to support the streamlined human health and ecological risk assessments. Due to low ecological risks associated primarily with the wetland area in the northwest portion of the site, that area was re-designated as AOC 55D and was addressed separately from AOC 55B.

There were no unacceptable human health or ecological risks identified at the site. A No Action Proposed Plan was issued for public comment in August 2003. The Navy and EPA, with MassDEP concurrence, signed a No Action ROD in October 2003.

3.2.13 Area of Concern 55D

AOC 55D is a 0.44-acre wetland located in the northwest portion of the Base, north of Trotter Road. The site was originally part of the northwest section of AOC 55B, which contained miscellaneous construction, household, and other debris. The wetland consists of a large water-filled depression at the base of a slope east of Route 18, and is surrounded by woods. Sediment and surface water samples were collected at AOC 55D from the wetland area, initially as part of the AOC 55B investigations, and later as part of AOC 55D. VOCs, SVOCs, and PCBs in sediment, and pesticides and metals in sediment and surface water exceeded established benchmark screening levels.

In 2004, a streamlined ecological risk assessment was completed using the data collected from the previous sampling events. The risk assessment determined that the site sediment and surface soils did not pose unacceptable risk to ecological receptors. A human health risk assessment was also completed; human health risks were determined to be below the EPA target level for surface water and sediment at the site.

The Navy concluded that there was no unacceptable risk to human health or the environment and therefore issued a No Action Proposed Plan in June 2007. A No Action ROD was signed by the Navy and EPA, with MassDEP concurrence, in December 2007.

3.2.14 Area of Concern 60

AOC 60, the East Mat Drainage Ditch, is located in the east-central portion of the Base, adjacent to the East Mat. The ditches provided drainage from the East Mat and the surrounding areas. AOC 60 includes

the eastern portion of the ditch; the western portion of the ditch is part of AOC 61. The primary use of the East Mat was as a mooring area for lighter-than-air aircraft, aircraft fuel discharge area, aircraft de-arming area, and as a taxiway and parking area for aircraft. During the 1950s through the 1970s, aircraft fuel tanks (and likely other unspecified material) were reportedly drained directly into the drainage ditches surrounding the East Mat. The East Mat is currently paved with asphalt. The remaining area surrounding the ditch consists of wooded areas and wetlands.

Surface water and sediment samples collected during multiple investigations were used in a streamlined ecological risk assessment. Based on the identified risks due to PAHs, the Navy removed approximately 63 tons of sediment from 3 locations in the East Mat Ditch and the northernmost section of the downstream tributary in January 2004. In January 2006, additional sediment sampling conducted in the ditch identified a PAH hot spot. As a result, approximately 31 tons of sediment were removed in 2007.

A Technical Memorandum completed in 2008 compiled the current conditions data set and screened the data against human health and ecological benchmarks. Based on results of these evaluations, the Navy concluded that the removal actions successfully mitigated the identified risks and determined that the site does not pose an unacceptable risk to human health or the environment. The EPA has concurred with this conclusion.

Navy issued a No Further Action Proposed Plan in September 2008. A No Further Action ROD was signed by Navy and EPA, with MassDEP concurrence, in January 2009.

3.2.15 Area of Concern 61

The TACAN Outfall is located in the center of the triangular area created by former Runways 17-35 and 8-26 and Taxiway C. The TACAN Outfall itself is comprised of a 700-foot pipe that drains storm water (collected from a number of swales, ditches, and catch basins) from large areas of the Base. The Base storm water drainage system consists of a series of drains, manholes, ditches and swales, connected by underground piping that ranges from 4 to 60 inches in diameter. The investigated areas which contribute to the TACAN Outfall are the Navy Exchange (NEX) Swale, Fuel Farm Swale, Review Item Area (RIA) 30B Swale, Virgo Street Ditch, Connecting Swale, Barracks Ditch, East Mat Ditch (west end only), TACAN Tributary, and the Taxiway C Ditch.

Following collection of sediment samples and additional exploratory sampling, the Navy performed a non-time critical removal action to clean accumulated sediment and other materials from the catch basins, manholes, drainage ditches, and approximately 36,000 linear feet of storm water drainage pipes that discharge to the TACAN Outfall. The work began in October 2002 and was completed in January 2004.

In 2006, the Navy collected additional sediment and subsurface soil samples in three of the upgradient ditches that discharge to the TACAN Outfall. The results confirmed that the earlier removal actions reduced potential human health and ecological risks to acceptable levels. Soil samples from the banks of the TACAN outfall were collected in 2008 for PCB analysis to address an EPA concern about flood flow backup at the outfall. PCBs were detected in a few samples; no PCB screening levels were exceeded. The Navy prepared a Technical Memorandum that compiled the current conditions data sets and determined that there were no unacceptable risks to human health and the environment.

The Navy issued a No Further Action Proposed Plan in September 2008. A No Further Action ROD was signed by the Navy and EPA, with MassDEP concurrence, in January 2009.

3.2.16 Area of Concern 100

AOC 100, the East Street Gate Area, is a 0.5 acre area of building rubble debris near the southwest fence line of the Base. Various materials, including building debris (mainly bricks) and potential asbestos-containing material, were disposed of in wooded areas of the site. Surface soil samples were collected from the rubble piles and surrounding area. Based on the soils data, approximately 1,190 tons of debris and associated soil were removed. Confirmatory soil samples were collected; the results indicated that the cleanup levels had been achieved and that no significant risk remained to human health or the environment. The Navy used the soil data to determine the potential for compounds to leach into groundwater. The evaluation determined that groundwater was not a medium of concern.

Based on the results of the removal action and groundwater evaluation, the Navy issued a No Further Action Proposed Plan in October 2005. The Navy and EPA, with MassDEP concurrence, signed a No Further Action ROD in May 2006.

TABLES

TABLE 2-2
RDA - MONITORING LOCATIONS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH MASSACHUSETTS
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Monitoring Location	
Groundwater	
RDA-TT01	West side of landfill
RDA-TT02	Northeastern boundary of landfill; potentially downgradient of former PCB hotspot
RDA-TT03	Along east-central portion of the landfill boundary
RDA-TT04	Along southeastern boundary of landfill
RDA-TT05	Along east-central portion of the landfill boundary
RDA-TT06	North end of landfill, in tree line; potentially downgradient of former PCB hotspot
RDA-TT07	Center of landfill
RDA-MW05	Adjacent to southeast boundary of landfill, upgradient location
RDA-MW50D	Northeastern boundary of landfill, downgradient location
RDA-MW50D2	Northeastern boundary of landfill, downgradient location
Surface Water/Sediment	
RDA-SW01/SD01	Northeastern boundary of landfill; potentially downgradient of former PCB hotspot
RDA-SW02/SD02	Along east-central portion of landfill boundary
RDA-SW01/SD03	In wetland area southeast of landfill boundary.
RDA-SWU	Old Swamp River east of landfill, upstream location
RDA-SWD	Old Swamp River adjacent to north end of culverts north of landfill, downstream location
Small Mammal Tissue	
RDA-ET01	Northern end of landfill
RDA-ET02	Former PCB hotspot area of landfill extending from GV-07 to RDA-TT02
RDA-ET03	Three areas including one from the center of the landfill in the vicinity of GV-04 and two areas from the southern portion of the landfill adjacent to the wetland
Landfill Gas	
GV-01	Passive gas vent
GV-02	Passive gas vent
GV-03	Passive gas vent
GV-04	Passive gas vent
GV-05	Passive gas vent
GV-06	Passive gas vent
GV-07	Passive gas vent
GV-08	Passive gas vent

TABLE 2-2
RDA - MONITORING LOCATIONS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH MASSACHUSETTS
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Monitoring Location	
GP-01	Perimeter landfill gas probe
GP-02	Perimeter landfill gas probe
GP-03	Perimeter landfill gas probe
GP-04	Perimeter landfill gas probe
GP-05	Perimeter landfill gas probe
GP-06	Perimeter landfill gas probe
GP-07	Perimeter landfill gas probe

TABLE 2-3
RDA GROUNDWATER ANALYTICAL SUMMARY STATISTICS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
VOLATILE ORGANIC COMPOUNDS (UG/L)			
ACETONE	3/44	3-14	RDA-GW-TT05-0307
BENZENE	1/44	2-2	RDA-GW-TT04-0307
CARBON DISULFIDE	1/44	3-3	RDA-GW-TT01-0907
CHLOROBENZENE	10/44	1-38	RDA-GW-TT05-0607
CYCLOHEXANE	13/44	1-20	RDA-GW-TT05-0907
ISOPROPYLBENZENE	1/44	2-2	RDA-GW-TT05-0607
METHYL CYCLOHEXANE	9/44	2-13	RDA-GW-TT05-0607
TETRACHLOROETHENE	1/44	2-2	RDA-GW-TT01-0607
TOLUENE	3/44	1-4	RDA-GW-TT02-0907
VPH (UG/L)			
C5-C8 ALIPHATICS	14/43	100-170	3 max samples
SEMIVOLATILE ORGANIC COMPOUNDS (UG/L)			
2-METHYLNAPHTHALENE	7/41	0.1-0.61	RDA-GW-TT05-0307
4-METHYLPHENOL	3/41	2-3	2 max samples
ACENAPHTHENE	12/41	0.11-0.2	2 max samples
ANTHRACENE	1/41	0.35-0.35	RDA-GW-TT07-0307
BENZO(A)ANTHRACENE	2/41	0.11-0.54	RDA-GW-TT07-0307
BENZO(A)PYRENE	1/41	0.42-0.42	RDA-GW-TT07-0307
BENZO(B)FLUORANTHENE	1/41	0.59-0.59	RDA-GW-TT07-0307
BENZO(G,H,I)PERYLENE	1/41	0.22-0.22	RDA-GW-TT07-0307
BENZO(K)FLUORANTHENE	1/41	0.23-0.23	RDA-GW-TT07-0307
BIS(2-ETHYLHEXYL)PHTHALATE	1/41	1-1	RDA-GW-MW50D-0607
CAPROLACTAM	1/41	1-1	RDA-GW-MW05-1207
CHRYSENE	1/41	0.6-0.6	RDA-GW-TT07-0307
FLUORANTHENE	2/41	0.32-1.9	RDA-GW-TT07-0307
FLUORENE	2/41	0.14-0.19	RDA-GW-TT07-0307
INDENO(1,2,3-CD)PYRENE	1/41	0.2-0.2	RDA-GW-TT07-0307
NAPHTHALENE	6/41	0.12-0.91	RDA-GW-TT05-0607
PENTACHLOROPHENOL	2/32	0.3-0.69	RDA-GW-MW50D-0607-D
PHENANTHRENE	2/41	0.27-0.95	RDA-GW-TT07-0307
PHENOL	2/41	1-3	RDA-GW-TT02-0607
PYRENE	2/41	0.25-1.5	RDA-GW-TT07-0307
EPH (UG/L)			
C11-C22 AROMATICS	1/40	100-100	RDA-GW-TT06-0907
PESTICIDES/PCBs			
ALPHA-CHLORDANE	1/42	0.02-0.02	RDA-GW-TT07-0307
AROCLOR-1254	2/43	0.31-1.2	RDA-GW-TT06-0307
GAMMA-CHLORDANE	2/42	0.019-0.021	RDA-GW-TT07-0307
HEPTACHLOR EPOXIDE	1/42	0.012-0.012	RDA-GW-TT04-0607
HERBICIDES (UG/L)			
DICAMBA	1/40	1.4-1.4	RDA-GW-TT02-0907
TOTAL METALS (UG/L)			
ALUMINUM	21/42	28.3-22700	RDA-GW-MW05-0607
ARSENIC	17/42	1.6-45.7	2 max samples
BARIUM	42/42	14-261	RDA-GW-TT02-0907
BERYLLIUM	3/42	0.067-0.36	RDA-GW-MW05-0307
CADMIUM	10/42	0.16-1.1	RDA-GW-TT03-0307
CALCIUM	42/42	4880-211000	RDA-GW-TT02-0907
CHROMIUM	14/42	1.3-20.7	RDA-GW-MW05-0607
COBALT	27/42	1.9-97.9	RDA-GW-MW05-0607
COPPER	3/42	6.3-16.9	RDA-GW-MW05-0607

TABLE 2-3
RDA GROUNDWATER ANALYTICAL SUMMARY STATISTICS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
IRON	42/42	756-61100	RDA-GW-TT03-1207
LEAD	7/42	0.58-22.8	RDA-GW-MW05-0607
MAGNESIUM	42/42	1330-16400	RDA-GW-TT02-0907
MANGANESE	41/42	149-23000	RDA-GW-TT04-1207
NICKEL	15/42	1.8-10.1	RDA-GW-MW05-0607
POTASSIUM	41/42	1220-11100	RDA-GW-TT02-0907
SELENIUM	11/42	3.5-40.6	RDA-GW-TT02-0607
SILVER	13/42	4.2-40.8	RDA-GW-TT02-0907
SODIUM	42/42	4700-52900	RDA-GW-MW05-1207
THALLIUM	9/42	3.5-44.8	RDA-GW-TT04-1207
VANADIUM	13/42	0.79-15.7	RDA-GW-MW05-0607
FILTERED METALS (UG/L)			
ALUMINUM	14/42	19.4-2110	RDA-GW-TT01-0307
ANTIMONY	1/42	5.2-5.2	RDA-GW-MW05D2-1207
ARSENIC	16/42	2.3-34.2	RDA-GW-TT07-0907
BARIUM	42/42	11.6-224	RDA-GW-TT02-0907
CADMIUM	8/42	0.19-0.49	RDA-GW-TT07-0607
CALCIUM	42/42	4530-192000	RDA-GW-TT02-0907
CHROMIUM	15/42	0.27-18.3	RDA-GW-TT04-0607
COBALT	27/42	2-59.4	RDA-GW-TT04-1207
IRON	40/42	1170-57900	RDA-GW-TT03-1207
LEAD	10/42	0.49-6.9	RDA-GW-TT04-0307
MAGNESIUM	42/42	766-15000	RDA-GW-TT02-0907
MANGANESE	41/42	55.7-22400	RDA-GW-TT04-0607
NICKEL	15/42	2-6.5	RDA-GW-TT02-1207
POTASSIUM	41/42	1190-9980	RDA-GW-TT02-0907
SELENIUM	12/42	1.5-38.3	RDA-GW-TT02-0607
SILVER	12/42	1.7-38.9	RDA-GW-TT02-0907
SODIUM	42/42	4820-51600	RDA-GW-MW05-1207
THALLIUM	9/42	4.3-53.3	RDA-GW-TT04-1207
VANADIUM	10/42	0.5-4.6	RDA-GW-TT01-0307
MISCELLANEOUS PARAMETERS (MG/L)			
ALKALINITY	40/40	39-780	RDA-GW-MW50D2-0907
CHEMICAL OXYGEN DEMAND	24/42	23-55	RDA-GW-TT02-1207
CHLORIDE	40/40	2.7-16	RDA-GW-TT06-0907
CYANIDE	3/32	6.6-15.4	RDA-GW-MW05-0307
FERROUS IRON	38/39	0.41-52	RDA-GW-TT07-0607
NITRATE	2/22	0.18-0.56	RDA-GW-TT01-0607
SULFATE	17/40	7.3-100	RDA-GW-TT04-1207
TOTAL DISSOLVED SOLIDS	40/40	110-860	RDA-GW-TT04-0907

TABLE 2-4
RDA GROUNDWATER ANALYTICAL SUMMARY STATISTICS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
PAGE 1 OF 2

Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
VOLATILE ORGANIC COMPOUNDS (UG/L)			
BTEX	1/22	1.6-1.6	RDA-GW-TT03-0608
CHLOROBENZENE	7/33	7.4-65	RDA-GW-TT05-0408
CYCLOHEXANE	2/33	4.1-5.6	RDA-GW-TT05-0608
ISOPROPYLBENZENE	4/33	1.3-1.8	2 max samples
METHYL CYCLOHEXANE	2/33	5-7.8	RDA-GW-TT05-0608
TOLUENE	1/33	14-65	RDA-GW-TT03-0608
TOTAL CHLORINATED VOCS	5/22	1-4	RDA-GW-TT05-0408
VPH (UG/L)			
C5-C8 ALIPHATICS	9/33	120-1100	RDA-GW-TT05-0608
SEMIVOLATILE ORGANIC COMPOUNDS (UG/L)			
2-METHYLNAPHTHALENE	5/30	0.12-0.6	RDA-GW-TT05-0608
ACENAPHTHENE	7/30	0.1-0.16	RDA-GW-MW50D2-0408
BENZALDEHYDE	1/30	1.6-1.6	RDA-GW-TT02-0908
BIS(2-ETHYLHEXYL)PHTHALATE	2/30	1.1-1.4	RDA-GW-TT01-0408
LOW MOLECULAR WEIGHT PAHS	10/21	0.1-1.34	RDA-GW-TT05-0608
NAPHTHALENE	5/30	0.12-0.74	RDA-GW-TT05-0608
TOTAL PAHS	10/21	0.1-1.34	RDA-GW-TT05-0608
EPH (UG/L)			
C11-C22 AROMATICS	1/28	130-130	RDA-GW-TT06-0908
HERBICIDES (UG/L)			
MCPA	1/30	250-250	RDA-GW-TT06-0908
TOTAL METALS (UG/L)			
ALUMINUM	4/33	244-1930	RDA-GW-MW05-0408
ARSENIC	8/33	2.7-8.5	RDA-GW-MW50D2-0908
BARIUM	33/33	18.6-208	RDA-GW-TT02-0608
BERYLLIUM	2/33	0.069-0.11	RDA-GW-MW05-0408
CADMIUM	13/33	1.1-5.7	2 max samples
CALCIUM	33/33	6200-213000	RDA-GW-TT02-0408
CHROMIUM	1/33	1.3-1.3	RDA-GW-TT06-0608
COBALT	16/33	2.1-48.6	RDA-GW-TT04-0408
IRON	33/33	137-66400	RDA-GW-TT07-0908
MAGNESIUM	33/33	804-15300	RDA-GW-TT02-0408
MANGANESE	33/33	93.5-23300	RDA-GW-TT04-0408
NICKEL	4/33	1.9-2.6	RDA-GW-MW50D-0908
POTASSIUM	33/33	1210-11100	RDA-GW-TT02-0608
SELENIUM	8/33	5.3-14	RDA-GW-TT04-0908
SODIUM	33/33	3070-45700	RDA-GW-MW05-0908
THALLIUM	8/32	4.6-13.4	RDA-GW-TT04-0408
VANADIUM	14/33	0.42-2.6	RDA-GW-TT01-0908
ZINC	11/33	9.8-25.1	RDA-GW-TT06-0608
FILTERED METALS (UG/L)			
ALUMINUM	6/30	42.9-267	RDA-GW-TT06-0408
ANTIMONY	9/30	2.7-8.9	RDA-GW-MW50D-0908
BARIUM	30/30	18.1-205	2 max samples
BERYLLIUM	2/30	0.056-0.061	RDA-GW-TT05-0408-D
CADMIUM	17/30	0.25-5.6	2 max samples
CALCIUM	30/30	6270-209000	RDA-GW-TT02-0408
COBALT	13/30	2.8-48.7	RDA-GW-TT04-0408
IRON	30/30	167-64200	RDA-GW-TT07-0908
LEAD	2/30	1.2-1.9	RDA-GW-TT06-0408
MAGNESIUM	30/30	772-15100	RDA-GW-TT02-0408

TABLE 2-4
RDA GROUNDWATER ANALYTICAL SUMMARY STATISTICS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS

Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
MANGANESE	30/30	94.9-22500	RDA-GW-TT04-0408
NICKEL	10/30	1.6-3.9	RDA-GW-TT01-0408
POTASSIUM	30/30	1210-11400	RDA-GW-TT02-0608
SELENIUM	8/30	7.1-16.1	RDA-GW-MW50D2-0908
SODIUM	30/30	3210-42400	RDA-GW-MW05-0408
THALLIUM	8/20	3.2-13	RDA-GW-TT04-0408
VANADIUM	15/30	0.5-2.4	RDA-GW-TT01-0908
ZINC	18/30	11.4-25.9	RDA-GW-TT02-0608
MISCELLANEOUS PARAMETERS (MG/L)			
ALKALINITY	28/28	57-650	RDA-GW-TT02-0908
CHEMICAL OXYGEN DEMAND	26/33	20-110	RDA-GW-TT06-0608
CHLORIDE	28/28	3-23	RDA-GW-TT06-0908
CYANIDE	5/32	2.8-8	RDA-GW-TT04-0608
FERROUS IRON	28/28	0.86-42	RDA-GW-TT03-0408
NITRATE-N	1/28	0.31-0.31	RDA-GW-TT01-0408
SULFATE	11/28	5.9-140	RDA-GW-TT04-0408
TOTAL DISSOLVED SOLIDS	26/28	150-710	RDA-GW-TT02-0408

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TABLE 2-5
RDA GROUNDWATER ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS

FRACTION (UNITS)	SAMPLE_ID	MCL	MMCL	ROD RG	RDA-GW-MW05-0307	RDA-GW-MW05-0607	RDA-GW-MW05-0907	RDA-GW-MW05-1207	RDA-GW-MW50D-0307	RDA-GW-MW50D-0607	RDA-GW-MW50D-0607-D	RDA-GW-MW50D-0907	RDA-GW-MW50D-1207	RDA-GW-MW50D2-0307	RDA-GW-MW50D2-0607	RDA-GW-MW50D2-0907	RDA-GW-MW50D2-1207	RDA-GW-TT01 0307	RDA-GW-TT01 0607	RDA-GW-TT01 0907	RDA-GW-TT01 1207	RDA-GW-TT02 0307	RDA-GW-TT02 0607	RDA-GW-TT02 0907	RDA-GW-TT02 1207	RDA-GW-TT03 0307	RDA-GW-TT03 0607
	LOCATION_ID				RDA-MW05	RDA-MW05	RDA-MW05	RDA-MW05	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D2	RDA-MW50D2	RDA-MW50D2	RDA-MW50D2	RDA-TT01	RDA-TT01	RDA-TT01	RDA-TT01	RDA-TT02	RDA-TT02	RDA-TT02	RDA-TT02	RDA-TT03	RDA-TT03
	SAMPLE_DATE				03/22/07	06/18/07	09/17/07	12/05/07	03/19/07	06/19/07	06/19/07	09/18/07	12/06/07	03/20/07	06/19/07	09/18/07	12/06/07	03/23/07	06/18/07	09/17/07	12/05/07	03/22/07	06/22/07	09/19/07	12/07/07	03/21/07	06/21/07
	QC_TYPE										DUPLICATE																
VOLATILES (UG/L)	ACETONE				5 UJ	5 UJ	1 UJ	5 UJ	5 UJ	5 UJ	5 UJ	1 UJ	5 UJ	5 UJ	5 UJ	1 UJ	5 UJ	5 UJ	5 UJ	1 UJ	5 UJ	5 UJ	3 J	1 UJ	5 UJ	5 UJ	5 U
	BENZENE	5	5		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CARBON DISULFIDE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CHLOROBENZENE	100	100		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CYCLOHEXANE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	ISOPROPYLBENZENE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	METHYL CYCLOHEXANE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 UJ
	TETRACHLOROETHENE	5	5		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	TOLUENE	1000	1000		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2	4	1	1 U	1 U
VPH MADEP (UG/L)	C5-C8 ALIPHATICS		300		100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 U	100	110
SEMIVOLATILES (UG/L)	2-METHYLNAPHTHALENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	4-METHYLPHENOL				10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	3 J	3 J	2 J	10 U	10 U	10 U
	ACENAPHTHENE				0.1 U	0.1 U	NA	0.1 U	0.16	0.13	0.12	0.17	0.15	0.19	0.13	0.2	0.2	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.11	0.1 U	0.1 U	0.1 U
	ANTHRACENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	BENZO(A)ANTHRACENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
	BENZO(A)PYRENE	0.2	0.2	0.2	0.1 UJ	0.1 U	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	NA	NA	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U
	BENZO(B)FLUORANTHENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
	BENZO(G,H,I)PERYLENE				0.1 U	0.1 UJ	NA	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	NA	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
	BENZO(K)FLUORANTHENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
	BIS(2-ETHYLHEXYL)PHTHALATE	6	6		10 U	10 U	NA	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U
	CAPROLACTAM				10 U	10 U	NA	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U
	CHRYSENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
	FLUORANTHENE				0.1 U	0.1 UJ	NA	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	NA	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
	FLUORENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	INDENO(1,2,3-CD)PYRENE				0.1 U	10 U	NA	10 U	0.1 U	10 U	10 U	10 U	10 U	0.1 U	10 U	10 U	10 U	0.1 U	10 U	NA	NA	0.1 U	10 U	10 U	10 U	0.1 U	10 U
	NAPHTHALENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.13	0.1 U	0.12	0.12 U	0.1 U	0.1 U
	PENTACHLOROPHENOL	1	1		0.1 UJ	0.5 UR	NA	0.5 UJ	0.1 UJ	0.5 UR	0.69 J	0.5 U	0.5 UJ	0.1 UJ	0.5 UR	0.5 U	0.5 UJ	0.1 UJ	0.3 J	NA	NA	0.1 UJ	0.5 UR	0.5 U	0.5 UJ	0.1 UJ	0.5 UR
	PHENANTHRENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	PHENOL				10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	10 U	3 J	10 U	10 U	10 U	10 U
	PYRENE				0.1 U	0.1 UJ	NA	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	NA	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
EPH MADEP (UG/L)	C11-C22 AROMATICS		200		100 U	100 U	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U
HERBICIDES (UG/L)	DICAMBA				0.1 UJ	0.1 U	NA	NA	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	1 UJ	0.1 UJ	0.1 UJ	0.1 U	NA	NA	0.1 UJ	0.1 U	1.4 J	0.1 UJ	0.1 UJ	0.1 U
PESTICIDES/PCBS (UG/L)	ALPHA-CHLORDANE	2	2		0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	GAMMA-CHLORDANE	2	2		0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.019 J	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
	HEPTACHLOR EPOXIDE	0.2	0.2		0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
	PCBs - AROCLOR-1254		0.5		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.31	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
METALS (UG/L)	ALUMINUM				9380	22700	1310	4620	7 U	14 U	14 U	39.5 J	37 U	26.5 UJ	14 U	50.5 J	37 U	3410	615	NA	NA	41.3 UJ	28.3 J	46.2 J	37 J	70.5 UJ	14 U
	ARSENIC	10	10	10	5.7 U	7 J	11.7 U	2.5 U	[illegible]	4.3 UJ	3.3 J	[illegible]	6.1 UJ	[illegible]	4.6 J	[illegible]	7 UJ	0.8 U	1.6 J	NA	NA	0.8 U	1.6 UJ	2.5 U	[illegible]	23	1.7 J
	BARIUM	2000	2000		141	229	62 J	87.3 J	74.8 J	74.1 J	73.3 J	77.6 J	69.3 J	92.1 J	67.2 J	90.6 J	84.6 J	55.1 J	49.2	NA	NA	95 J	215	261	186 J	55.1 J	49.6 J
	BERYLLIUM	4	4		0.36 J	0.32 J	0.067 J	0.32 UJ	0.075 U	0.15 U	0.15 U	0.051 U	0.15 UJ	0.075 U	0.15 U	0.051 U	0.15 UJ	0.075 U	0.15 U	NA	NA	0.075 U	0.15 U	0.051 U	0.079 UJ	0.075 U	0.15 U
	CADMIUM	5	5		0.66 UJ	0.67 J	0.54 UJ	0.19 UJ	0.37 UJ	0.38 J	0.37 J	4.1 UJ	0.46 UJ	0.47 UJ	0.29 J	3.9 UJ	0.39 UJ	0.05 U	0.1 U	NA	NA	0.059 UJ	0.16 J	1.9 UJ	0.11 U	1.1 J	0.46 J
	CALCIUM				9550	16800	4880	6600	30000	29700	29800	23500	29800	31700	24600	24000	29600	52800	41500	NA	NA	82300	188000	211000	184000	33800	31900
	CHROMIUM	100	100		2.8 J	20.7	0.54 UJ	1.9 UJ	1.7 UJ	7.6 J	8 J	0.22 U	0.78 UJ	1.5 UJ	5.9 J	0.22 U	0.78 UJ	9.9 J	1.6 J	NA	NA	0.81 UJ	2.9 J	0.22 U	0.37 UJ	1.4 UJ	6.8 J
	COBALT				20.3 J	97.9	23.1 J	16 J	0.075 U	5.2 J	5.2 J	14.3 J	6 J	0.15 UJ	4.2 J	13.7 J	5.8 J	1.2 UJ	0.7 UJ	NA	NA	0.075 U	0.69 UJ	5.6 J	2.9 J	0.075 U	0.96 UJ
	COPPER	1300	1300		6.3 UJ	16.9 J	1.7 U	1.7 U	10.6 UJ	6.3	6.3 U	1.7 U	1.7 U	7.5 UJ	6.3 U	1.7 U	1.7 U	12.7 UJ	6.3 U	NA	NA	4.5 UJ	6.3 U	1.7 U	2.1 UJ	3.2 U	6.3 U
	IRON				13300	48100	7440	11700	43100	43000	42500	45400	48700	43000	33800	43100	46400	1130	756	NA	NA	9060	19800	20800	23000	45700	47500
	LEAD	15	15		8.5	**22.8**	1.2 UJ	6 UJ	3.6 UJ	0.75 J	0.46 U	1.2 U	2.4 UJ	3.3 UJ	0.46 U	1.2 U	3.3 UJ	1.8 UJ	0.46 U	NA	NA	0.23 U	0.46 U	1.2 U	2 UJ	2.9 UJ	0.46 U
	MAGNESIUM				4180	9370	2230	2770	6390	6660	6630	7010	6800	6460	5350	6760	6510	1330	1370	NA	NA	6980	13700	16400	14400	6360	6600
	MANGANESE			313	[illegible]	[illegible]	2590	[illegible]	10900	10700	10600	11500	11900	[illegible]	[illegible]	[illegible]	10500	163	276	NA	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MERCURY		2		0.047 UJ	0.047 U	0.11 UJ	0.11 U	0.047 UJ	0.047 U	0.047 U	0.11 UJ	0.11 U	0.047 UJ	0.047 U	0.12 UJ	0.11 U	0.047 UJ	0.047 U	NA	NA	0.047 UJ	0.047 U	0.11 U	0.11 U	0.047 J	0.047 U
	NICKEL				3 UJ	10.1 J	1.5 UJ	2.6 J	1.9 UJ	1.5 UJ	1.9 UJ	2.3 J	3 J	1.1 UJ	1.4 UJ	1.9 J	2.3 J	2 UJ	3.1 UJ	NA	NA	0.36 UJ	3.2 UJ	3.5 J	6.4 J	0.3 U	0.59 U
	POTASSIUM				1600	3110	1320	1760	2050	2040	2030	1870	2340	3060	1810	2400	2280	6700	9860	NA	NA	5590	10400	11100	10500	4360	2830
	SELENIUM	50	50		3.7 UJ	0.98 UJ	5.2 U	5.2 U	4.9 UJ	0.98 UJ	0.98 UJ	5.2 U	5.8 J	4.8 UJ	3.5 J	5.2 U	7.5 J	5.3 UJ	12.7 J	NA	NA	4.4 UJ	40.6	5.2 U	15.5 J	5.8 UJ	0.98 UJ
	SILVER				8.1 UJ	8.4 J	1.2 U	13.3 UJ	16	5.4 J	5.6 J	1.2 U	26.4 UJ	14.6 J	4.2 J	1.2 U	30 U	0.46 U	0.91 U	NA	NA	0.46 U	0.91 U	40.8	1.2 U	14.8 J	6.9 J
	SODIUM				37500	25900	43200	52900	5900	5650	5670	5900	5970	6470	4700	6060	5870	6830	8490	NA	NA	13900	18700	17900	16500	9140	5350
	THALLIUM	2	2		0.6 U	1.2 UJ	2.8 U	**3.5 J**	0.6 U	1.2 UJ	1.2 UJ	2.8 U	[illegible]	0.6 U	1.2 UJ	2.8 U	[illegible]	2 UJ	1.2 UJ	NA	NA	0.6 U	1.2 UJ	2.8 U	[illegible]	0.6 U	1.2 UJ
	VANADIUM				1.4 UJ	15.7 J	0.85 J	0.47 UJ	0.24 U	0.47 U	0.47 U	2.5 J	0.4 U	0.24 U	0.47 U	2.5 J	0.4 U	6 J	1.8 J	NA	NA	0.45 UJ	0.93 J	1.7 J	1.2 UJ	0.24 U	0.47 U
	CYANIDE	200	200		9.1 U	9.1 UJ	NA	4.3 U	9.1 U	9.1 UJ	9.1 UJ	4.3 U	4.3 U	9.1 U	9.1 UJ	4.3 U	8.2 UJ	9.1 U	9.1 UJ	NA	NA	9.1 U	9.1 U	4.3 U	4.3 U	9.1 U	9.1 UJ

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-5
RDA GROUNDWATER ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS

FRACTION (UNITS)	SAMPLE_ID	MCL	MMCL	ROD RG	RDA-GW-MW05-0307	RDA-GW-MW05-0607	RDA-GW-MW05-0907	RDA-GW-MW05-1207	RDA-GW-MW50D-0307	RDA-GW-MW50D-0607	RDA-GW-MW50D-0607-D	RDA-GW-MW50D-0907	RDA-GW-MW50D-1207	RDA-GW-MW50D2-0307	RDA-GW-MW50D2-0607	RDA-GW-MW50D2-0907
	LOCATION_ID				RDA-MW05	RDA-MW05	RDA-MW05	RDA-MW05	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D2	RDA-MW50D2	RDA-MW50D2
	SAMPLE_DATE				03/22/07	06/18/07	09/17/07	12/05/07	03/19/07	06/19/07	06/19/07	09/18/07	12/06/07	03/20/07	06/19/07	09/18/07
	QC_TYPE										DUPLICATE					
DISSOLVED METALS (UG/L)	ALUMINUM				36.6 UJ	325	37 U	216	7 UJ	14 U	14 U	37 U	37 U	7 UJ	14 U	37 U
	ANTIMONY	6	6		0.6 U	2 UJ	4.4 U	4.4 U	0.6 U	2.5 UJ	1.2 U	4.4 U	4.4 U	0.6 U	1.2 U	4.4 U
	ARSENIC	10	10	10	1.4 UJ	2.6 J	2.7 UJ	2.8 UJ	[illegible]	4.7 J	5.7 J	[illegible]	10.1 UJ	[illegible]	6 J	[illegible]
	BARIUM	2000	2000		73.4 J	53 J	46.6 J	61 J	68.5 J	58.7 J	62.3 J	69.4 J	77.1 J	88.2 J	87 J	83.2 J
	CADMIUM	5	5		0.082 UJ	0.1 U	0.5 UJ	0.11 U	0.26 UJ	0.28 J	0.28 J	3.8 UJ	0.11 U	0.56 UJ	0.43 J	3.5 UJ
	CALCIUM				6360	8030	4530	5100	29300	25000	26200	21900	31800	30900	30100	22300
	CHROMIUM	100	100		1.1 UJ	4.3 J	0.4 J	1.5 UJ	1.6 UJ	6.6 J	7.2 J	0.22 UJ	0.99 UJ	1.6 UJ	7.4 J	0.22 UJ
	COBALT				14.8 J	44.2 J	19.6 J	12.5 J	0.69 UJ	4.4 J	4.5 J	13.2 J	6.3 J	0.32 UJ	5.1 J	12.7 J
	IRON				4530	13600	3900	4560	40400	35700	37500	41500	48900	41100	41800	38900
	LEAD	15	15		0.89 UJ	0.49 J	1.2 U	1.9 UJ	3.7 UJ	0.46 U	0.57 J	1.2 U	2.9 UJ	2.7 UJ	0.99 J	1.2 U
	MAGNESIUM				2150	3160	1780	1780	6280	5640	5910	6500	7040	6310	6520	6190
	MANGANESE			313	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NICKEL				2.2 UJ	2.4 UJ	1.7 UJ	2.2 J	2.5 UJ	2 UJ	1.9 UJ	2.7 J	3.2 J	1.7 UJ	1.2 UJ	2.1 J
	POTASSIUM				1450	1380	1250	1590	2030	1760	1820	1770	2270	2990	2230	2250
	SELENIUM	50	50		4.5 UJ	0.98 UJ	5.2 U	5.2 U	6.4 UJ	0.98 UJ	0.98 UJ	5.2 U	10.4 J	3.8 UJ	1.5 J	5.2 U
	SILVER				0.46 U	1.7 J	1.2 U	1.2 U	14.8 J	4.9 J	4.7 J	1.2 U	5.7 UJ	13.7 UJ	5.7 J	1.2 U
	SODIUM				37500	20600	40800	51600	5900	4820	5000	5540	6250	6420	5780	5720
	THALLIUM	2	2		0.6 U	1.2 UJ	2.8 U	[illegible]	0.6 U	1.2 UJ	1.2 UJ	4.3 UJ	**25.5**	0.6 U	1.2 UJ	5.2 UJ
	VANADIUM				0.24 U	0.47 U	0.4 UJ	0.4 U	0.24 U	0.47 U	0.47 U	2.3 J	0.4 U	0.24 U	0.47 U	2.4 J
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY				94	95	NA	NA	150	170	170	130	140	140	160	780
	CHEMICAL OXYGEN DEMAND				23	20 U	NA	20 U	24	20 U	23	20 U	24	28	21 U	20 U
	CHLORIDE	250			5.6	3.8	NA	NA	5.3	4	4	5 J	5.6	5.5	4.1	4.8 J
	FERROUS IRON				13	16	NA	NA	21	2.61	2.67 J	2.29	23.3 J	25	2.48	2.34
	NITRATE	10			0.13 U	0.13 U	NA	NA	0.13 UJ	0.13 U	0.13 U	NA	NA	0.13 U	0.13 U	NA
	SULFATE	250			13	7.3 B	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	TOTAL DISSOLVED SOLIDS	500			440	180 J	NA	NA	210	110 J	370 J	190	210	210	200 J	180

SAMPLE_ID	RDA-GW-MW50D2-1207	RDA-GW-TT01 0307	RDA-GW-TT01 0607	RDA-GW-TT01 0907	RDA-GW-TT01 1207	RDA-GW-TT02 0307	RDA-GW-TT02 0607	RDA-GW-TT02 0907	RDA-GW-TT02 1207	RDA-GW-TT03 0307	RDA-GW-TT03 0607
LOCATION_ID	RDA-MW50D2	RDA-TT01	RDA-TT01	RDA-TT01	RDA-TT01	RDA-TT02	RDA-TT02	RDA-TT02	RDA-TT02	RDA-TT03	RDA-TT03
SAMPLE_DATE	12/06/07	03/23/07	06/18/07	09/17/07	12/05/07	03/22/07	06/22/07	09/19/07	12/07/07	03/21/07	06/21/07
QC_TYPE											
ALUMINUM	37 U	2110 J	19.4 J	NA	NA	14.7 UJ	14 U	37 U	37 U	7 UJ	14 U
ANTIMONY	5.2 J	3.2 UJ	1.2 U	NA	NA	2.9 UJ	1.2 U	4.4 U	4.4 U	0.6 U	3.1 UJ
ARSENIC	9.4 UJ	0.8 U	2.9 J	NA	NA	0.8 U	1.6 UJ	2.5 U	5 UJ	**23.7**	1.6 UJ
BARIUM	89.9 J	44.1 J	38.3 J	NA	NA	95.3 J	173 J	224	193 J	55.2 J	41.6 J
CADMIUM	0.11 U	0.17 UJ	0.1 U	NA	NA	0.05 U	0.19 J	1.6 UJ	0.11 U	0.46 UJ	0.34 J
CALCIUM	30600	47500	34600	NA	NA	85400	163000	192000	170000	34800	27000
CHROMIUM	0.83 UJ	8.7 J	0.38 U	NA	NA	0.69 UJ	2.4 J	0.89 J	0.22 UJ	1.3 UJ	5.6 J
COBALT	5.9 J	0.55 UJ	0.23 UJ	NA	NA	0.075 U	0.61 UJ	4.5 J	2.7 J	0.075 U	0.88 UJ
IRON	44800	69.8 UJ	20.4 UJ	NA	NA	8930	14100	17100	21200	45300	39700
LEAD	3.1 UJ	0.36 UJ	0.46 U	NA	NA	0.36 UJ	0.46 U	2 UJ	2.8 UJ	2.9 UJ	0.64 J
MAGNESIUM	6530	766	1090	NA	NA	7250	12100	15000	13700	6400	5700
MANGANESE	[illegible]	55.7	284	NA	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
NICKEL	2.9 J	1.2 UJ	2.7 UJ	NA	NA	0.99 UJ	3.1 UJ	3.8 J	6.5 J	0.61 UJ	0.59 U
POTASSIUM	2240	6710	7880	NA	NA	5740	9180	9980	9140	4420	2490
SELENIUM	9.4 J	5.7 UJ	18.2 J	NA	NA	6.8 UJ	38.3	5.2 U	7.8 J	4.7 UJ	0.98 UJ
SILVER	5 UJ	0.46 U	0.91 U	NA	NA	0.46 U	0.91 U	38.9	1.2 U	13.7 J	5.7 J
SODIUM	6020	6870	6450	NA	NA	14300	17100	16200	14900	8990	5370
THALLIUM	**23.3**	0.86 UJ	1.2 UJ	NA	NA	0.6 U	1.2 UJ	2.8 U	[illegible]	0.6 U	1.2 UJ
VANADIUM	0.4 U	4.6 J	0.65 J	NA	NA	0.53 UJ	0.47 U	1.1 J	1.2 UJ	0.24 U	0.47 U
ALKALINITY	170	110	120	NA	NA	320	400	140	550	160	100
CHEMICAL OXYGEN DEMAND	23	20 U	20 U	NA	20 U	44	53	54	55	35	32
CHLORIDE	5.8	4.6	2.7	NA	NA	7.6	8.4	12 J	8.9	7	5.9
FERROUS IRON	22.5 J	0.41	0.37 U	NA	NA	6	16.5	2.41	18.2 J	30	8.2
NITRATE	NA	0.18	0.56	NA	NA	0.13 U	0.13 U	NA	NA	0.13 U	0.13 U
SULFATE	5 U	8.4	5 U	NA	NA	13	5 U	5 U	5 U	5 U	5 U
TOTAL DISSOLVED SOLIDS	200	150	180 J	NA	NA	320	[illegible]	[illegible]	[illegible]	160 J	230 J

MCL - Maximum Contaminant Level
MMCL - Massachusetts MCL
ROD RG - ROD-specified Remedial Goal

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE; J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

DRAFT

TABLE 2-5
RDA GROUNDWATER ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS
PAGE 3 OF 4

FRACTION (UNITS)	SAMPLE_ID / LOCATION_ID / SAMPLE_DATE / QC_TYPE	MCL	MMCL	ROD RG	RDA-GW-TT03 0907 RDA-TT03 09/18/07	RDA-GW-TT03 1207 RDA-TT03 12/06/07	RDA-GW-TT04 0307 RDA-TT04 03/20/07	RDA-GW-TT04 0607 RDA-TT04 06/21/07	RDA-GW-TT04 0907 RDA-TT04 09/14/07	RDA-GW-TT04 0907-D RDA-TT04 09/14/07 DUPLICATE	RDA-GW-TT04 1207 RDA-TT04 12/06/07	RDA-GW-TT05 0307 RDA-TT05 03/21/07	RDA-GW-TT05 0607 RDA-TT05 06/21/07	RDA-GW-TT05 0907 RDA-TT05 09/14/07	RDA-GW-TT05 1207 RDA-TT05 12/06/07	RDA-GW-TT05 1207-D RDA-TT05 12/06/07 DUPLICATE	RDA-GW-TT06 0307 RDA-TT06 03/21/07	RDA-GW-TT06 0607 RDA-TT06 06/22/07	RDA-GW-TT06 0907 RDA-TT06 09/17/07	RDA-GW-TT06 1207 RDA-TT06 12/05/07	RDA-GW-TT07 0307 RDA-TT07 03/19/07	RDA-GW-TT07 0307-D RDA-TT07 03/19/07 DUPLICATE	RDA-GW-TT07 0607 RDA-TT07 06/21/07	RDA-GW-TT07 0907 RDA-TT07 09/18/07	RDA-GW-TT07 1207 RDA-TT07 12/07/07
VOLATILES (UG/L)	ACETONE				1 UJ	5 UJ	5 UJ	5 UJ	1 UJ	1 UJ	5 UJ	14 J	5 U	1 UJ	5 UJ	5 UJ	5 UJ	6	1 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	1 UJ	5 UJ
	BENZENE	5	5		1 U	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CARBON DISULFIDE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CHLOROBENZENE	100	100		1 U	1 U	37	32	28	28	1	15	38	34	24	23	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CYCLOHEXANE				1 U	1 U	1 U	1 U	5	4	1 U	10	18	20	9	9	1 U	1 U	1 U	1 U	7	7	6	3	6
	ISOPROPYLBENZENE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	METHYL CYCLOHEXANE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	10	13 J	1 U	3	3	1 U	1 U	1 U	1 U	1 U	6	6	2 J	2	3
	TETRACHLOROETHENE	5	5		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	TOLUENE	1000	1000		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VPH MADEP (UG/L)	C5-C8 ALIPHATICS		300		130	120	140	120	110	110	100 U	100 U	140	120	100 U	100 U	100 U	100 U	100 U	100 U	170	170	150	100 U	170
SEMIVOLATILES (UG/L)	2-METHYLNAPHTHALENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.61	0.55	0.21	0.19	0.18	0.1 U	0.1 U	0.1 U	0.1 U	0.17	0.1	0.1 U	0.1 U	0.1 U
	4-METHYLPHENOL				10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	ACENAPHTHENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.14	0.1 U	0.1 U	0.1 U	0.1 U
	ANTHRACENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.35 J	0.1 UJ	0.1 U	0.1 U	0.1 U
	BENZO(A)ANTHRACENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.54 J	0.11 J	0.1 U	0.1 U	0.1 U
	BENZO(A)PYRENE	0.2	0.2	0.2	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.43	0.1 UJ	0.1 U	0.1 U	0.1 U
	BENZO(B)FLUORANTHENE				0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.59 J	0.1 UJ	0.1 U	0.1 U	0.1 U
	BENZO(G,H,I)PERYLENE				0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.22 J	0.1 UJ	0.1 UJ	0.1 U	0.1 U
	BENZO(K)FLUORANTHENE				0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.23 J	0.1 UJ	0.1 U	0.1 U	0.1 U
	BIS(2-ETHYLHEXYL)PHTHALATE	6	6		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	CAPROLACTAM				10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	CHRYSENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.6 J	0.1 UJ	0.1 U	0.1 U	0.1 U
	FLUORANTHENE				0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	1.9 J	0.32 J	0.1 UJ	0.1 U	0.1 U
	FLUORENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.14	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.19	0.1 U	0.1 U	0.1 U	0.1 U
	INDENO(1,2,3-CD)PYRENE				10 U	10 U	0.1 U	10 U	10 U	10 U	10 U	0.1 U	10 U	10 U	10 U	10 U	0.1 U	10 U	10 U	10 U	0.2	0.1 U	10 U	10 U	10 U
	NAPHTHALENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.39	0.91	0.29	0.24 U	0.24 U	0.1 U	0.1 U	0.1 U	0.1 U	0.16	0.1 U	0.1 U	0.1 U	0.1 U
	PENTACHLOROPHENOL	1	1		0.5 U	0.5 UJ	0.1 UJ	0.5 UR	0.5 U	0.5 U	0.5 UJ	0.1 UJ	0.5 UR	0.5 U	0.5 UJ	0.5 UJ	0.1 UJ	0.5 UR	0.5 U	0.5 UJ	0.1 UJ	0.1 UJ	0.5 UR	0.5 U	0.5 UJ
	PHENANTHRENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.95 J	0.27 J	0.1 U	0.1 U	0.1 U
	PHENOL				10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	PYRENE				0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	1.5 J	0.25 J	0.1 UJ	0.1 U	0.1 U
EPH MADEP (UG/L)	C11-C22 AROMATICS		200		100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
HERBICIDES (UG/L)	DICAMBA				0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ
PESTICIDES/PCBS (UG/L)	ALPHA-CHLORDANE	2	2		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.02 J	0.01 U	0.01 U	0.01 U	0.01 U
	GAMMA-CHLORDANE	2	2		0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.021 J	0.01 UJ	0.01 U	0.01 U	0.01 UJ
	HEPTACHLOR EPOXIDE	0.2	0.2		0.01 U	0.01 UJ	0.01 U	0.012 J	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ
	PCBs - AROCLOR-1254		0.5		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	[redacted]	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
METALS (UG/L)	ALUMINUM				47.3 J	37 U	7 U	46.8 J	72.5 J	85.9 J	37 U	71.9 UJ	14 U	57.2 J	37 U	37 U	257	170 J	220	135 J	7 U	7 U	14 U	56.4 J	37 U
	ARSENIC	10	10	10	[redacted]	2.5 U	0.8 U	1.6 UJ	6 UJ	8.6 UJ	3.7 UJ	0.8 U	1.6 UJ	[redacted]	2.5 U	2.8 UJ	0.8 U	1.6 UJ	2.5 U	2.5 U	[redacted]	[redacted]	4.1 J	[redacted]	2.5 U
	BARIUM	2000	2000		56 J	45.1 J	126	165 J	170 J	171 J	195 J	25.2 J	59 J	81.2 J	76.3 J	78.1 J	28.5 J	14 J	66.8 J	68.2 J	63.2 J	63.3 J	63.2	86.3 J	87.9 J
	BERYLLIUM	4	4		0.051 U	0.13 UJ	0.075 U	0.15 U	0.051 U	0.051 U	0.14 UJ	0.075 U	0.15 U	0.051 U	0.13 UJ	0.13 UJ	0.075 U	0.15 U	0.051 U	0.09 UJ	0.075 U	0.075 U	0.15 U	0.051 U	0.14 UJ
	CADMIUM	5	5		4.5 UJ	0.81 UJ	0.17 UJ	0.3 J	1.6 UJ	1.6 UJ	0.17 UJ	0.15 UJ	0.32 J	3.6 UJ	0.41 UJ	0.44 UJ	0.05 U	0.1 U	0.33 UJ	0.11 U	0.52 UJ	0.52 UJ	0.58 J	5.2 U	0.6 UJ
	CALCIUM				22100	29100	46500	47600	41700	42100	55500	23000	25300	30500	49600	48700	10300	5040	22600	29700	21400	21400	21700	12200	19700
	CHROMIUM	100	100		0.22 U	0.99 UJ	3.7 J	18 J	0.22 U	0.22 U	2.2 UJ	0.92 UJ	7.7 J	0.22 U	0.92 UJ	0.88 UJ	1.1 UJ	1.3 J	1 UJ	1.1 UJ	1.6 UJ	1.5 UJ	8.9 J	0.22 U	0.84 UJ
	COBALT				10.5 J	1.5 UJ	32.5	50.4	53 J	53.5 J	59.9 J	5 J	2 J	8.9 J	1.9 J	1.9 J	0.51 UJ	0.15 U	1.5 UJ	1.4 UJ	0.075 U	0.075 U	2.4 J	17.6 J	3 J
	COPPER	1300	1300		1.7 U	1.7 U	13.2 UJ	6.3 U	1.7 U	1.7 U	8.6 UJ	7.7 UJ	6.3 U	1.7 U	1.7 U	1.7 U	7.7 UJ	6.3 U	4.6 UJ	1.7 U	5 UJ	4.2 UJ	14.3 J	1.7 U	1.7 U
	IRON				50100	61100	3510	11100	15900	16400	20800	4690	37600	40700	49400	48600	1420	1990	1940	4670	52300	52200	57900	58900	60300
	LEAD	15	15		1.2 U	3.3 UJ	6.4	0.95 J	1.2 U	1.2 U	3.5 UJ	2.1 UJ	0.58 J	1.2 U	3.4 UJ	2.1 UJ	0.84 UJ	0.46 U	1.7 UJ	1.7 UJ	3.1 UJ	4 UJ	2.7 J	1.2 U	2.5 UJ
	MAGNESIUM				6900	7290	8490	8730	7830	8040	9490	3510	6350	7190	9740	9650	2950	2350	5130	6780	6560	6550	7350	7830	7030
	MANGANESE			313	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	149	101 U	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	MERCURY		2		0.11 U	0.11 U	0.047 UJ	0.047 U	0.11 U	0.11 U	0.11 U	0.047 UJ	0.047 U	0.11 U	0.11 U	0.11 U	0.047 UJ	0.047 U	0.11 U	0.11 U	0.047 UJ	0.047 UJ	0.047 U	0.11 U	0.11 U
	NICKEL				0.94 UJ	0.93 UJ	4.4 UJ	4.4 J	1.8 J	1.6 UJ	4.1 J	2.5 UJ	0.8 UJ	1.2 UJ	2.1 J	2.2 J	3 UJ	1.5 UJ	2 J	3 J	0.38 UJ	0.75 UJ	0.59 U	1 UJ	0.66 UJ
	POTASSIUM				2720	2840	1860	1800	1780	1780	2310	3380	1880	2100	2750	2670	4170	1970	2270	3380	1220	1230	1310	1160 U	1470
	SELENIUM	50	50		5.2 U	8 J	25.7 U	18.3 J	5.2 U	5.2 U	14.9 J	6.5 UJ	0.98 UJ	5.2 U	10.4 J	9.3 J	2 UJ	0.98 UJ	5.2 U	5.2 U	0.82 UJ	2.9 UJ	0.98 UJ	5.2 U	5.2 U
	SILVER				1.2 U	36.2 U	0.46 U	0.91 U	1.2 U	1.2 U	1.2 U	0.46 U	4.7 J	1.2 U	22.1 UJ	22.3 UJ	0.46 U	0.91 U	4.8 UJ	1.2 U	27.1	27.3	9.8 J	1.2 U	37.6 U
	SODIUM				5860	5620	10200	10100	10100	9970	10800	5170	5240	7210	10900	10500	9090	9850	15100	12100	5280	5320	5370	5370	5180
	THALLIUM	2	2		4.1 UJ	[redacted]	0.6 U	1.2 UJ	2.8 U	2.8 U	[redacted]	0.6 U	1.2 UJ	3.5 UJ	[redacted]	[redacted]	1.6 UJ	1.2 UJ	2.8 U	2.8 U	0.6 U	0.6 U	1.2 UJ	2.8 U	[redacted]
	VANADIUM				2.3 J	0.4 U	0.24 U	0.47 U	0.4 UJ	0.4 UJ	0.4 U	0.96 UJ	0.47 U	2.3 J	0.4 U	0.4 U	0.73 UJ	0.79 J	1.9 J	1.1 UJ	0.24 U	0.24 U	0.47 U	2.8 J	0.4 U
	CYANIDE	200	200		4.3 U	4.3 U	12.4 J	9.1 UJ	6.6 J	4.3 UJ	9.4 UJ	15.4 J	9.1 UJ	4.3 UJ	4.3 U	4.3 U	9.1 U	9.1 U	4.3 U	4.3 U	9.1 U	9.1 U	9.1 U	4.3 U	4.3 U

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-5
RDA GROUNDWATER ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS
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FRACTION (UNITS)	SAMPLE_ID / LOCATION_ID / SAMPLE_DATE / QC_TYPE	MCL	MMCL	ROD RG	RDA-GW-TT03 0907 RDA-TT03 09/18/07	RDA-GW-TT03 1207 RDA-TT03 12/06/07	RDA-GW-TT04 0307 RDA-TT04 03/20/07	RDA-GW-TT04 0607 RDA-TT04 06/21/07	RDA-GW-TT04 0907 RDA-TT04 09/14/07	RDA-GW-TT04 0907-D RDA-TT04 09/14/07 DUPLICATE	RDA-GW-TT04 1207 RDA-TT04 12/06/07	RDA-GW-TT05 0307 RDA-TT05 03/21/07	RDA-GW-TT05 0607 RDA-TT05 06/21/07	RDA-GW-TT05 0907 RDA-TT05 09/14/07	RDA-GW-TT05 1207 RDA-TT05 12/06/07	RDA-GW-TT05 1207-D RDA-TT05 12/06/07 DUPLICATE	RDA-GW-TT06 0307 RDA-TT06 03/21/07	RDA-GW-TT06 0607 RDA-TT06 06/22/07	RDA-GW-TT06 0907 RDA-TT06 09/17/07	RDA-GW-TT06 1207 RDA-TT06 12/05/07	RDA-GW-TT07 0307 RDA-TT07 03/19/07	RDA-GW-TT07 0307-D RDA-TT07 03/19/07 DUPLICATE	RDA-GW-TT07 0607 RDA-TT07 06/21/07	RDA-GW-TT07 0907 RDA-TT07 09/18/07	RDA-GW-TT07 1207 RDA-TT07 12/07/07
DISSOLVED METALS (UG/L)	ALUMINUM				40.5 J	37 U	7 U	14 U	60.7 J	57.5 J	37 U	22.3 UJ	14 U	45.1 J	37 U	37 U	224	78.4 J	129 J	134 J	739 J	7 UJ	14 U	43.8 J	37 U
	ANTIMONY	6	6		4.4 U	4.4 U	4.7 UJ	1.2 U	4.4 U	4.4 U	4.4 U	3.3 UJ	5.7 UJ	4.4 U	4.4 U	4.4 U	1.5 UJ	2.3 UJ	4.4 U	4.4 U	0.6 U	0.6 U	3.2 UJ	4.4 U	4.4 U
	ARSENIC	10	10	10	[illegible]	7.9 UJ	0.8 U	2.8 J	9 UJ	6.5 UJ	3.6 UJ	0.8 U	1.6 UJ	21.8 U	4.9 UJ	5.1 UJ	0.8 U	1.6 UJ	2.5 U	3.1 UJ	[illegible]	[illegible]	2.3 J	[illegible]	13.3 UJ
	BARIUM	2000	2000		50.3 J	53.1 J	130	165 J	159 J	159 J	210	24.8 J	60.8 J	81.8 J	87.6 J	89.5 J	29.3 J	11.6 J	63.5 J	71.9 J	69.7 J	61.3 J	52.3 J	77.5 J	99 J
	CADMIUM	5	5		4.1 UJ	0.11 U	0.11 UJ	0.28 J	1.5 UJ	1.5 UJ	0.11 U	0.15 UJ	0.42 J	3.7 UJ	0.11 U	0.11 U	0.05 U	0.1 U	0.27 UJ	0.11 U	0.6 UJ	0.59 UJ	0.49 J	4.8 UJ	0.11 U
	CALCIUM				20100	29600	47800	50800	38700	39400	53200	22300	26200	30800	49300	48900	10000	6160	21200	27400	21900	21100	18700	11100	20200
	CHROMIUM	100	100		0.22 UJ	0.87 UJ	3.8 J	18.3 J	0.22 UJ	0.22 UJ	1.8 UJ	0.83 UJ	8 J	0.22 UJ	0.88 UJ	1.1 UJ	0.96 UJ	0.38 U	0.27 J	0.73 UJ	4 J	1.8 UJ	6.9 J	0.22 UJ	1.2 UJ
	COBALT				9.4 J	1.5 UJ	34.9	54.2	49.6 J	50.2 J	59.4 J	5.1 J	2.2 J	8.6 J	2.1 J	2.1 J	0.78 UJ	0.15 U	1.2 UJ	1.3 UJ	0.075 U	0.075 U	2 J	16.2 J	2.8 J
	IRON				45400	57900	3520	11200	14800	15000	19400	4540	38700	39900	46200	46600	1170	1480	1410	4350	53900	50900	48000	52900	57100
	LEAD	15	15		1.2 U	3.4 UJ	6.9	1.4 J	1.2 U	1.2 U	3.5 UJ	1.2 UJ	1.6 J	1.2 U	3.4 UJ	3.8 UJ	1.2 UJ	0.46 U	12.2 U	2.1 UJ	6.2	4.8 J	1.7 J	1.2 U	3.2 UJ
	MAGNESIUM				6290	7150	8760	9140	7340	7510	9090	3380	6550	7120	9560	9580	2800	2140	4930	6240	6830	6460	6320	7040	6830
	MANGANESE			313	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	145	89.5 U	304	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NICKEL				1.6 UJ	1.6 UJ	5.5 UJ	5.2 J	2.5 J	2.8 J	4.5 J	3.1 UJ	1.5 UJ	1.1 UJ	2.9 J	3.1 J	4.1 UJ	1.5 UJ	2 J	3.1 J	1.8 UJ	1.3 UJ	0.59 U	1.3 UJ	1.4 UJ
	POTASSIUM				2510	2700	1910	1900	1640	1670	2130	3390	1980	2110	2510	2580	4470	1820	2200	3210	1300	1190	1210	1100 U	1350
	SELENIUM	50	50		5.2 U	6.7 J	29.4 U	17 J	5.2 U	5.2 U	15.9 J	3.1 UJ	0.98 UJ	5.2 U	9.1 J	12.9 J	2.8 UJ	0.98 UJ	5.2 U	5.2 U	1.6 UJ	3.3 UJ	0.98 UJ	5.2 U	10.5 J
	SILVER				1.2 U	7.9 UJ	0.46 U	0.91 U	1.2 U	1.2 U	1.2 U	0.46 U	4.9	1.2 U	3.5 UJ	4 UJ	0.46 U	0.91 U	4.3 UJ	1.2 U	27.9	26.1	7.8 J	1.2 U	8.9 UJ
	SODIUM				5380	5620	10600	10800	9350	9350	10200	5240	5560	7250	10700	10500	8640	9140	14500	12200	5280	5210	5420	5010	5040
	THALLIUM	2	2		2.8 U	**23.7**	0.6 U	1.2 UJ	2.8 U	2.8 U	**53.3**	0.6 U	1.2 UJ	2.8 U	**27.4**	**27**	1.7 UJ	1.2 UJ	2.8 U	2.8 U	0.6 U	0.6 U	1.2 UJ	8.4 UJ	**23.2**
	VANADIUM				2 J	0.4 U	0.24 U	0.47 U	0.4 UJ	0.4 UJ	0.4 U	1.2 UJ	0.47 U	2.3 J	0.4 U	0.4 U	1 UJ	0.5 J	1.5 J	0.85 UJ	0.24 U	0.24 U	0.47 U	2.5 J	0.4 U
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY				120	180	170	200	150	160	160	80	110	120	180	220	62	48	39	59	110	110	78	110	190
	CHEMICAL OXYGEN DEMAND				20 U	33	20 U	20 U	20 U	20 U	20 U	20 U	30	25	37	32	46	20 U	40	44	39	42	32	20 U	27
	CHLORIDE	250			7.9 J	8	8.3	8.5	8.6 J	8.5 J	12	5	7.1	8.1	12	13	8.1	8.9	16 J	9.4	7.1	7.1	6.4	8.5 J	9.6
	FERROUS IRON				2.56	6.18 J	2.7	10.9	11.3	12.9	16.6 J	3.3	31.8	21.4	21.9 J	32 J	1.07	2.25	1.46	2.43 J	35 J	NA	52	21.4	42 J
	NITRATE	10			NA	NA	0.13 U	0.13 U	NA	NA	NA	0.13 U	0.13 U	NA	NA	NA	0.13 U	0.13 U	NA	NA	0.13 UJ	0.13 UJ	0.13 U	NA	NA
	SULFATE	250			5 U	5 U	44	41 B	26	26	100	13	5 U	21	80	82	10	5 U	36	65	5 U	5 U	5 U	5 U	11
	TOTAL DISSOLVED SOLIDS	500			230	210	260	250 J	[illegible]	230	320	130	190 J	210	330	330	120	120 J	170	220	170	190	180 J	210	200

MCL - Maximum Contaminant Level
MMCL - Massachusetts MCL
ROD RG - ROD-specified Remedial Goal

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-5
RDA GROUNDWATER ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS

FRACTION (UNITS)	SAMPLE_ID	MCL	MMCL	ROD RG	RDA-GW-TT03 0907	RDA-GW-TT03 1207	RDA-GW-TT04 0307	RDA-GW-TT04 0607	RDA-GW-TT04 0907	RDA-GW-TT04 0907-D	RDA-GW-TT04 1207	RDA-GW-TT05 0307	RDA-GW-TT05 0607	RDA-GW-TT05 0907
	LOCATION_ID				RDA-TT03	RDA-TT03	RDA-TT04	RDA-TT04	RDA-TT04	RDA-TT04	RDA-TT04	RDA-TT05	RDA-TT05	RDA-TT05
	SAMPLE_DATE				09/18/07	12/06/07	03/20/07	06/21/07	09/14/07	09/14/07	12/06/07	03/21/07	06/21/07	09/14/07
	QC_TYPE									DUPLICATE				
DISSOLVED METALS (UG/L)	ALUMINUM				40.5 J	37 U	7 U	14 U	60.7 J	57.5 J	37 U	22.3 UJ	14 U	45.1 J
	ANTIMONY	6	6		4.4 U	4.4 U	4.7 UJ	1.2 U	4.4 U	4.4 U	4.4 U	3.3 UJ	5.7 UJ	4.4 U
	ARSENIC	10	10	10	[illegible]	7.9 UJ	0.8 U	2.8 J	9 UJ	6.5 UJ	3.6 UJ	0.8 U	1.6 UJ	21.8 U
	BARIUM	2000	2000		50.3 J	53.1 J	130	165 J	159 J	159 J	210	24.8 J	60.8 J	81.8 J
	CADMIUM	5	5		4.1 UJ	0.11 U	0.11 UJ	0.28 J	1.5 UJ	1.5 UJ	0.11 U	0.15 UJ	0.42 J	3.7 UJ
	CALCIUM				20100	29600	47800	50800	38700	39400	53200	22300	26200	30800
	CHROMIUM	100	100		0.22 UJ	0.87 UJ	3.8 J	18.3 J	0.22 UJ	0.22 UJ	1.8 UJ	0.83 UJ	8 J	0.22 UJ
	COBALT				9.4 J	1.5 UJ	34.9	54.2	49.6 J	50.2 J	59.4 J	5.1 J	2.2 J	8.6 J
	IRON				45400	57900	3520	11200	14800	15000	19400	4540	38700	39900
	LEAD	15	15		1.2 U	3.4 UJ	6.9	1.4 J	1.2 U	1.2 U	3.5 UJ	1.2 UJ	1.6 J	1.2 U
	MAGNESIUM				6290	7150	8760	9140	7340	7510	9090	3380	6550	7120
	MANGANESE			313	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NICKEL				1.6 UJ	1.6 UJ	5.5 UJ	5.2 J	2.5 J	2.8 J	4.5 J	3.1 UJ	1.5 UJ	1.1 UJ
	POTASSIUM				2510	2700	1910	1900	1640	1670	2130	3390	1980	2110
	SELENIUM	50	50		5.2 U	6.7 J	29.4 U	17 J	5.2 U	5.2 U	15.9 J	3.1 UJ	0.98 UJ	5.2 U
	SILVER				1.2 U	7.9 UJ	0.46 U	0.91 U	1.2 U	1.2 U	1.2 U	0.46 U	4.9	1.2 U
	SODIUM				5380	5620	10600	10800	9350	9350	10200	5240	5560	7250
	THALLIUM	2	2		2.8 U	**23.7**	0.6 U	1.2 UJ	2.8 U	2.8 U	**53.3**	0.6 U	1.2 UJ	2.8 U
	VANADIUM				2 J	0.4 U	0.24 U	0.47 U	0.4 UJ	0.4 UJ	0.4 U	1.2 UJ	0.47 U	2.3 J
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY				120	180	170	200	150	160	160	80	110	120
	CHEMICAL OXYGEN DEMAND				20 U	33	20 U	20 U	20 U	20 U	20 U	20 U	30	25
	CHLORIDE	250			7.9 J	8	8.3	8.5	8.6 J	8.5 J	12	5	7.1	8.1
	FERROUS IRON				2.56	6.18 J	2.7	10.9	11.3	12.9	16.6 J	3.3	31.8	21.4
	NITRATE	10			NA	NA	0.13 U	0.13 U	NA	NA	NA	0.13 U	0.13 U	NA
	SULFATE	250			5 U	5 U	44	41 B	26	26	100	13	5 U	21
	TOTAL DISSOLVED SOLIDS	500			230	210	260	250 J	[illegible]	230	320	130	190 J	210

FRACTION (UNITS)	SAMPLE_ID	MCL	MMCL	ROD RG	RDA-GW-TT05 1207	RDA-GW-TT05 1207-D	RDA-GW-TT06 0307	RDA-GW-TT06 0607	RDA-GW-TT06 0907	RDA-GW-TT06 1207	RDA-GW-TT07 0307	RDA-GW-TT07 0307-D	RDA-GW-TT07 0607	RDA-GW-TT07 0907	RDA-GW-TT07 1207
	LOCATION_ID				RDA-TT05	RDA-TT05	RDA-TT06	RDA-TT06	RDA-TT06	RDA-TT06	RDA-TT07	RDA-TT07	RDA-TT07	RDA-TT07	RDA-TT07
	SAMPLE_DATE				12/06/07	12/06/07	03/21/07	06/22/07	09/17/07	12/05/07	03/19/07	03/19/07	06/21/07	09/18/07	12/07/07
	QC_TYPE					DUPLICATE						DUPLICATE			
DISSOLVED METALS (UG/L)	ALUMINUM				37 U	37 U	224	78.4 J	129 J	134 J	739 J	7 UJ	14 U	43.8 J	37 U
	ANTIMONY	6	6		4.4 U	4.4 U	1.5 UJ	2.3 UJ	4.4 U	4.4 U	0.6 U	0.6 U	3.2 UJ	4.4 U	4.4 U
	ARSENIC	10	10	10	4.9 UJ	5.1 UJ	0.8 U	1.6 UJ	2.5 U	3.1 UJ	[illegible]	[illegible]	2.3 J	[illegible]	13.3 UJ
	BARIUM	2000	2000		87.6 J	89.5 J	29.3 J	11.6 J	63.5 J	71.9 J	69.7 J	61.3 J	52.3 J	77.5 J	99 J
	CADMIUM	5	5		0.11 U	0.11 U	0.05 U	0.1 U	0.27 UJ	0.11 U	0.6 UJ	0.59 UJ	0.49 J	4.8 UJ	0.11 U
	CALCIUM				49300	48900	10000	6160	21200	27400	21900	21100	18700	11100	20200
	CHROMIUM	100	100		0.88 UJ	1.1 UJ	0.96 UJ	0.38 U	0.27 J	0.73 UJ	4 J	1.8 UJ	6.9 J	0.22 UJ	1.2 UJ
	COBALT				2.1 J	2.1 J	0.78 UJ	0.15 U	1.2 UJ	1.3 UJ	0.075 U	0.075 U	2 J	16.2 J	2.8 J
	IRON				46200	46600	1170	1480	1410	4350	53900	50900	48000	52900	57100
	LEAD	15	15		3.4 UJ	3.8 UJ	1.2 UJ	0.46 U	12.2 U	2.1 UJ	6.2	4.8 J	1.7 J	1.2 U	3.2 UJ
	MAGNESIUM				9560	9580	2800	2140	4930	6240	6830	6460	6320	7040	6830
	MANGANESE			313	[illegible]	[illegible]	145	89.5 U	304	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11200
	NICKEL				2.9 J	3.1 J	4.1 UJ	1.5 UJ	2 J	3.1 J	1.8 UJ	1.3 UJ	0.59 U	1.3 UJ	1.4 UJ
	POTASSIUM				2510	2580	4470	1820	2200	3210	1300	1190	1210	1100 U	1350
	SELENIUM	50	50		9.1 J	12.9 J	2.8 UJ	0.98 UJ	5.2 U	5.2 U	1.6 UJ	3.3 UJ	0.98 UJ	5.2 U	10.5 J
	SILVER				3.5 UJ	4 UJ	0.46 U	0.91 U	4.3 UJ	1.2 U	27.9	26.1	7.8 J	1.2 U	8.9 UJ
	SODIUM				10700	10500	8640	9140	14500	12200	5280	5210	5420	5010	5040
	THALLIUM	2	2		**27.4**	**27**	1.7 UJ	1.2 UJ	2.8 U	2.8 U	0.6 U	0.6 U	1.2 UJ	8.4 UJ	**23.2**
	VANADIUM				0.4 U	0.4 U	1 UJ	0.5 J	1.5 J	0.85 UJ	0.24 U	0.24 U	0.47 U	2.5 J	0.4 U
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY				180	220	62	48	39	59	110	110	78	110	190
	CHEMICAL OXYGEN DEMAND				37	32	46	20 U	40	44	39	42	32	20 U	27
	CHLORIDE	250			12	13	8.1	8.9	16 J	9.4	7.1	7.1	6.4	8.5 J	9.6
	FERROUS IRON				21.9 J	32 J	1.07	2.25	1.46	2.43 J	35 J	NA	52	21.4	42 J
	NITRATE	10			NA	NA	0.13 U	0.13 U	NA	NA	0.13 UJ	0.13 UJ	0.13 U	NA	NA
	SULFATE	250			80	82	10	5 U	36	65	5 U	5 U	5 U	5 U	11
	TOTAL DISSOLVED SOLIDS	500			330	330	120	120 J	170	220	170	190	180 J	210	200

MCL - Maximum Contaminant Level
MMCL - Massachusetts MCL
ROD RG - ROD-specified Remedial Goal

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-6
RDA GROUNDWATER ANALYTICAL RESULTS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS
PAGE 1 OF 2

FRACTION (UNITS)	SAMPLE_ID	MCL	MMCL	ROD_RG	RDA-GW-MW05-0408	RDA-GW-MW05-0608	RDA-GW-MW05-0908	RDA-GW-MW50D-0408	RDA-GW-MW50D-0608	RDA-GW-MW50D-0608-D	RDA-GW-MW50D-0908	RDA-GW-MW50D2-0408	RDA-GW-MW50D2-0608	RDA-GW-MW50D2-0908	RDA-GW-TT01-0408	RDA-GW-TT01-0608	RDA-GW-TT01-0908	RDA-GW-TT02-0408	RDA-GW-TT02-0608	RDA-GW-TT02-0908	RDA-GW-TT03-0408	RDA-GW-TT03-0608	RDA-GW-TT03-0908	RDA-GW-TT03-0908-D	RDA-GW-TT04-0408	RDA-GW-TT04-0608	RDA-GW-TT04-0908	RDA-GW-TT05-0408	RDA-GW-TT05-0408-D	RDA-GW-TT05-0608
	LOCATION_ID				RDA-MW05	RDA-MW05	RDA-MW05	RDA-MW50	RDA-MW50	RDA-MW50	RDA-MW50	RDA-MW50	RDA-MW50	RDA-MW50	RDA-TT01	RDA-TT01	RDA-TT01	RDA-TT02	RDA-TT02	RDA-TT02	RDA-TT03	RDA-TT03	RDA-TT03	RDA-TT03	RDA-TT04	RDA-TT04	RDA-TT04	RDA-TT05	RDA-TT05	RDA-TT05
	SAMPLE_DATE				04/09/08	06/15/08	09/10/08	04/10/08	06/12/08	06/12/08	09/11/08	04/11/08	06/12/08	09/11/08	04/09/08	06/15/08	09/10/08	04/10/08	06/16/08	09/10/08	04/10/08	06/13/08	09/10/08	09/10/08	04/10/08	06/12/08	09/10/08	04/10/08	04/10/08	06/13/08
	SACODE	MCL	MMCL	ROD_RG						DUPLICATE														DUPLICATE					DUPLICATE	
VOLATILES (UG/L)	BTEX				1 U	1 U	NA	1 U	1 U	1 U	NA	1 U	1 U	NA	1 U	1 U	NA	1 U	1 U	NA	1 U	1.6	NA	NA	1 U	1 U	NA	1 U	1 U	1 U
	CHLOROBENZENE	100	100		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	14	22	7.4	65	62	43
	CYCLOHEXANE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.6
	ISOPROPYLBENZENE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.3	1.4	1.8
	METHYL CYCLOHEXANE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	7.8
	TOLUENE	1000	1000		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	TOTAL CHLORINATED VOCS				0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 U	NA	0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 UJ	NA	NA	14 J	22 J	NA	65 J	62 J	43 J
VPH MADEP (UG/L)	C5-C8 ALIPHATICS		300		100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 U	100 U	100 U	100 U	120 J	220	100 U	100 U	100 U	100 UJ	100 U	190 J	190 J	[illegible]
SEMIVOLATILES (UG/L)	2-METHYLNAPHTHALENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.24	0.26	0.6
	ACENAPHTHENE				0.1 U	0.1 U	NA	0.15	0.1	0.11	0.1 U	0.16	0.12	0.13	0.1 U	NA	NA	0.1 U	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	BENZALDEHYDE				10 UJ	10 UJ	NA	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U	10 UJ	NA	NA	10 UJ	10 UJ	1.6 J	10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ
	BIS(2-ETHYLHEXYL)PHTHALATE	6	6		10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.4 J	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.1 J	10 U
	LOW MOLECULAR WEIGHT PAHS				0.1 U	0.1 U	NA	0.15	0.1	0.11	NA	0.16	0.12	NA	0.1 U	NA	NA	0.1 U	0.1	NA	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	NA	0.72 J	0.71 J	1.34
	NAPHTHALENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.48 J	0.45 J	0.74
	TOTAL PAHS				0.1 U	0.1 U	NA	0.15	0.1	0.11	NA	0.16	0.12	NA	0.1 U	NA	NA	0.1 U	0.1 J	NA	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	NA	0.72 J	0.71 J	1.34
EPH MADEP (UG/L)	C11-C22 AROMATICS		200		NA	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	NA	100 UJ	100 UJ	100 U	100 U	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 UJ
HERBICIDES (UG/L)	MCPA				NA	100 U	NA	100 U	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
METALS (UG/L)	ALUMINUM				1930	256 U	653	37 U	56 U	56 U	56 U	37 U	56 U	56 U	37 U	68 UJ	56 U	37 U	56 U	56 U	37 U	56 U	56 U	56 U	37 U	56 U	56 U	37 U	37 U	56 U
	ARSENIC	10	10	10	2.5 U	5.3 U	5.3 U	5.1 J	5.3 U	5.3 U	8 J	4.1 J	6.1 J	8.5 J	2.5 U	5.3 U	5.3 U	2.5 U	5.3 U	5.3 U	2.5 U	5.3 U	8.4 J	5.3 U	2.7 J	5.3 U	5.3 U	2.5 U	2.5 U	5.3 U
	BARIUM	2000	2000		78 J	62.3 J	68.5 J	73.4 J	85.3 J	84.6 J	74 J	85.6 J	98.2 J	84.8 J	34.3 J	26.1 J	18.6 J	196 J	208	197 J	51.5 J	69.4 J	59.1 J	56.7 J	170 J	173 J	161 J	59 J	62.3 J	79.9 J
	BERYLLIUM	4	4		0.11 J	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.13 U	0.069 J	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.051 U	0.13 U
	CADMIUM	5	5		0.95 UJ	0.35 UJ	0.14 U	4.1 J	2.9 J	2.9 J	0.18 UJ	4.1 J	2.9 J	0.14 U	0.68 UJ	0.14 U	0.14 U	0.11 U	0.14 U	0.14 U	[illegible]	3.9 J	0.33 UJ	0.26 UJ	1.4 UJ	1.1 J	0.14 U	3.3 J	3.5 J	2.9 J
	CALCIUM				6460	6610	6800	27000	27700	27300	27000	26700	28000	27300	12700	21100	20100	213000	192000	186000	30500	30700	29000	28400	72800	64100	54300	31000	31300	26500
	CHROMIUM	100	100		0.25 UJ	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	0.22 U	1.1 U
	COBALT				27.8 J	16.9 J	14.8 J	5.9 J	4.6 J	4.4 J	4.3 J	5.7 J	4.3 J	4.1 J	3.9 J	1.2 U	1.2 U	2 UJ	1.2 U	1.2 U	1.3 UJ	1.2 U	1.2 U	1.2 U	48.6 J	41.1 J	37.3 J	2.1 J	2.5 J	1.2 U
	CYANIDE	200	200		2.4 U	2.4 U	NA	3.3 J	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.8 J	2.4 U	2.4 U	2.4 U	6.3 J	8 J	2.4 U	2.4 U	2.4 U	2.4 U
	IRON				9240	5240	8220	47300	45100	44600	45700	44700	43000	45400	9190	2110	137 J	25500	21000	20000	61100	57300	59000	56700	23900	25500	25700	38800	39400	43300
	MAGNESIUM				2640	2550	2510	6720	6730	6650	6480	6450	6530	6370	804	1590	1470	15300	14400	13500	7140	7190	6920	6650	15000	13000	10300	7850	7900	6930
	MANGANESE			313	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NICKEL				2.1 UJ	1.5 U	2.3 J	2.4 UJ	1.5 U	1.5 U	2.6 J	1.7 UJ	1.5 U	1.5 U	3.7 UJ	1.5 U	1.5 U	1 UJ	1.5 U	1.5 U	0.73 UJ	1.5 U	1.5 U	1.5 U	3.3 UJ	1.5 U	2.1 J	0.83 UJ	1.7 UJ	1.5 U
	POTASSIUM				1550	1500	1530	2040	2040	1980	2010	2170	2460	2190	1350	2340	3210	9730	11100	11000	2430	2640	2940	2900	2360	2120	2300	1960	1930	1680
	SELENIUM	50	50		5.2 U	6.6 U	6.6 U	5.2 U	6.6 U	6.6 U	12.7 J	5.2 U	6.6 U	7.5 J	5.2 U	6.6 U	6.6 U	5.3 J	6.6 U	6.6 U	5.2 U	6.6 U	11.1 J	11.9 J	5.2 U	6.6 U	14 J	5.2 U	5.2 U	6.6 U
	SODIUM				42800	40100	45700	5890	5770	5610	5560	5890	5890	5590	4810	4310	3070	25600	23400	20800	5230	5360	5700	5510	18300	15600	13300	6670	6740	5840
	THALLIUM	2	2		2.8 U	1 U	1 U	[illegible]	1 U	1 U	1 U	[illegible]	1 U	1 U	2.8 U	1 U	NA	2.8 U	1 U	1 U	[illegible]	1 U	1 U	1 U	[illegible]	1 U	1 U	[illegible]	[illegible]	1 U
	VANADIUM				1 J	0.96 U	0.96 U	1.8 J	0.96 U	0.96 U	0.99 J	1.9 J	0.96 U	1.1 J	0.4 U	0.96 U	2.6 J	1.6 J	0.96 U	0.96 U	1.8 J	0.96 U	0.96 U	0.96 U	0.42 J	0.96 U	0.96 U	1.5 J	1.6 J	0.96 U
	ZINC				21.3 UJ	15.6 J	16.3 UJ	19.6 UJ	11.5 J	10.5 J	12.4 UJ	20.6 UJ	13.7 J	9.9 UJ	20.6 UJ	20.6 J	18.7 UJ	14.6 UJ	13.1 J	16.1 UJ	20.6 UJ	10.4 J	19.2 UJ	14.5 UJ	12.6 UJ	9.8 J	7.7 U	18 UJ	19.6 UJ	11.4 J
DISSOLVED METALS (UG/L)	ALUMINUM				169 J	NA	NA	37 U	56 U	56 U	56 U	37 U	56 U	56 U	37 U	NA	56 U	37 U	56 U	56 U	37 U	56 U	56 U	56 U	37 U	56 U	56 U	49 J	42.9 J	56 U
	ARSENIC	10	10	10	2.5 U	NA	NA	5.1 J	8 J	5.3 U	8.9 J	2.7 J	6.9 J	6.5 J	2.5 U	NA	5.3 U	2.5 U	5.3 U	5.3 U	2.5 U	5.3 U	6 J	5.3 U	2.5 U	5.3 U	5.3 U	2.5 U	2.5 U	5.3 U
	BARIUM	2000	2000		62.2 J	NA	NA	72.3 J	86.3 J	85.6 J	73.4 J	84.9 J	99.7 J	82.6 J	32.3 J	NA	18.1 J	183 J	205	205	51.2 J	69 J	58.7 J	57.1 J	167 J	180 J	165 J	57.2 J	60.1 J	79.7 J
	BERYLLIUM	4	4		0.051 U	NA	NA	0.051 U	0.13 U	0.13 U	0.13 U	0.056 J	0.13 U	0.13 U	0.051 U	NA	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.061 J	0.13 U
	CADMIUM	5	5		0.66 J	NA	NA	4.2 J	2.8 J	2.8 J	0.14 U	4.1 J	2.7 J	0.36 UJ	0.99 J	NA	0.14 U	0.11 U	0.14 U	0.14 U	[illegible]	3.6 J	0.23 UJ	0.14 U	1 J	1 J	0.14 U	3.5 J	3.5 J	2.6 J
	CALCIUM				6270	NA	NA	27000	28000	28000	27100	26800	28500	26900	12200	NA	20900	209000	186000	187000	31100	31500	28700	30800	73000	66100	55400	30800	31000	26500
	COBALT				26.9 J	NA	NA	6.1 J	4.2 J	4.4 J	4.2 J	6.1 J	4.2 J	4.1 J	4.1 J	NA	1.2 U	2.1 UJ	1.2 U	1.2 U	1.4 UJ	1.2 U	1.2 U	1.2 U	48.7 J	42.5 J	37.8 J	2.2 UJ	2.8 J	1.2 U
	IRON				6780	NA	NA	46100	45400	45300	45900	44500	43700	44900	10200	NA	167 J	25700	20300	20700	61600	56900	58600	58100	24100	26100	26300	39000	38400	42900
	LEAD	15	15		1.2 U	NA	NA	1.2 U	2.2 U	2.2 U	2.2 U	1.2 U	2.2 U	2.2 U	1.2 U	NA	2.2 U	1.2 U	2.2 U	2.2 U	1.2 U	2.2 U	2.2 U	2.2 U	1.2 U	2.2 U	2.2 U	1.2 J	1.2 U	2.2 U
	MAGNESIUM				2310	NA	NA	6680	6770	6790	6460	6440	6690	6370	772	NA	1540	15100	14000	13300	7250	7230	6960	6900	14900	13400	10600	7850	7650	6930
	MANGANESE			313	[illegible]	NA	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NICKEL				1.8 J	NA	NA	2.4 J	1.5 UJ	1.5 UJ	2.1 J	1.9 J	1.5 UJ	1.5 U	3.9 J	NA	1.5 U	1.1 UJ	2.7 J	2.1 J	0.59 UJ	1.5 UJ	1.5 U	1.5 U	3.5 J	1.5 UJ	2.2 J	1.3 UJ	1.5 UJ	1.5 UJ
	POTASSIUM				1480	NA	NA	2020	2020	2030	2040	2160	2490	2190	1270	NA	3330	9310	11000	11400	2440	2660	2930	3090	2300	2160	2300	1890	1860	1680
	SELENIUM	50	50		5.2 U	NA	NA	5.2 U	6.6 U	6.6 U	11.3 J	5.2 U	6.6 U	16.1 J	5.2 U	NA	6.6 U	5.2 U	6.6 U	7.5 J	5.2 U	6.6 U	14 J	15.5 J	5.2 U	6.6 U	7.1 J	5.2 U	5.2 U	6.6 U
	SODIUM				42400	NA	NA	5840	5750	5810	5610	5910	6000	5570	4730	NA	3210	24700	23300	21500	5280	5330	5680	5700	17900	15900	13300	6670	6670	5870
	THALLIUM	2	2		2.8 U	NA	NA	[illegible]	NA	NA	NA	[illegible]	NA	NA	2.8 U	NA	NA	[illegible]	NA	NA	[illegible]	NA	NA	NA	[illegible]	NA	NA	[illegible]	[illegible]	NA
	VANADIUM				0.4 U	NA	NA	1.6 J	0.96 U	0.96 U	1 J	1.8 J	0.96 U	1.1 J	0.4 U	NA	2.4 J	1.7 J	0.96 U	1.3 J	1.8 J	0.96 U	0.96 U	0.96 U	0.5 J	0.96 U	0.96 U	1.6 J	1.6 J	0.96 U
	ZINC				19.2 J	NA	NA	18.4 J	14 J	13.2 J	11.2 UJ	18.3 J	14.1 J	11.2 UJ	24.3 J	NA	13.7 UJ	11.8 UJ	25.9 J	18.8 UJ	18.9 J	16.3 J	14 UJ	12 UJ	15.3 UJ	16.3 J	7.7 U	19.2 J	24.1 J	11.4 J
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY				NA	NA	NA	210	130	120	150	190	130	170	57	NA	NA	620	160	650	210	150	200	200	220	180	210	190	180	150
	CHEMICAL OXYGEN DEMAND				20 U	20 U	23	20	40	39	28	24	40	31	20 U	20 U	20 U	47	60	65	36	50	40	38	20 U	28	22	28	27	42
	CHLORIDE	250			NA	NA	NA	5.6	6.3	6.2	7.7	5.7	6.1	7.8	3	NA	NA	12	11	9.8	13	14	14	14	15	16	14	16	16	16
	FERROUS IRON				NA	NA	NA	32	27	23	2.47	28	25	0.86	8.3	NA	NA	22	15.7	15.5	42	41	41 J	1.94 J	19.8	23.4	2.05	31.8	32.6	30
	NITRATE-N	10			NA	NA	NA	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.31	NA	NA	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
	SULFATE	250			NA	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	8.1	NA	NA	67	5.9	5 U	5 U	5 U	5 U	5 U	140	96	82	6.6	6.5	5 U
	TOTAL DISSOLVED SOLIDS				NA	NA	NA	170	200	170	150	170	200	150	40 U	NA	NA	710	660	320	170	200	170	170	420	370	320	190	180	190

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE; J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-6
RDA GROUNDWATER ANALYTICAL RESULTS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS
PAGE 1 OF 2

FRACTION (UNITS)	SAMPLE_ID	MCL	MMCL	ROD_RG	RDA-GW-MW05-0408	RDA-GW-MW05-0608	RDA-GW-MW05-0908	RDA-GW-MW50D-0408	RDA-GW-MW50D-0608	RDA-GW-MW50D-0608-D	RDA-GW-MW50D-0908	RDA-GW-MW50D2-0408	RDA-GW-MW50D2-0608	RDA-GW-MW50D2-0908	RDA-GW-TT01-0408	RDA-GW-TT01-0608	RDA-GW-TT01-0908	RDA-GW-TT02-0408	RDA-GW-TT02-0608	RDA-GW-TT02-0908	RDA-GW-TT03-0408	RDA-GW-TT03-0608	RDA-GW-TT03-0908	RDA-GW-TT03-0908-D	RDA-GW-TT04-0408	RDA-GW-TT04-0608	RDA-GW-TT04-0908	RDA-GW-TT05-0408	RDA-GW-TT05-0408-D	RDA-GW-TT05-0608
	LOCATION_ID				RDA-MW05	RDA-MW05	RDA-MW05	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D	RDA-MW50D2	RDA-MW50D2	RDA-MW50D2	RDA-TT01	RDA-TT01	RDA-TT01	RDA-TT02	RDA-TT02	RDA-TT02	RDA-TT03	RDA-TT03	RDA-TT03	RDA-TT03	RDA-TT04	RDA-TT04	RDA-TT04	RDA-TT05	RDA-TT05	RDA-TT05
	SAMPLE_DATE				04/09/08	06/15/08	09/10/08	04/10/08	06/12/08	06/12/08	09/11/08	04/11/08	06/12/08	09/11/08	04/09/08	06/15/08	09/10/08	04/10/08	06/16/08	09/10/08	04/10/08	06/13/08	09/10/08	09/10/08	04/10/08	06/12/08	09/10/08	04/10/08	04/10/08	06/13/08
	SACODE									DUPLICATE														DUPLICATE					DUPLICATE	
VOLATILES (UG/L)	BTEX				1 U	1 U	NA	1 U	1 U	1 U	NA	1 U	1 U	NA	1 U	1 U	NA	1 U	1 U	NA	1 U	1.6	NA	NA	1 U	1 U	NA	1 U	1 U	1 U
	CHLOROBENZENE	100	100		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	14	22	7.4	65	62	43
	CYCLOHEXANE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.6
	ISOPROPYLBENZENE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.3	1.4	1.8
	METHYL CYCLOHEXANE				1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	7.8
	TOLUENE	1000	1000		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	TOTAL CHLORINATED VOCS				0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 U	NA	0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 UJ	NA	NA	14 J	22 J	NA	65 J	62 J	43 J
VPH MADEP (UG/L)	C5-C8 ALIPHATICS		300		100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 U	100 U	100 U	100 U	120 J	220	100 U	100 U	100 U	100 UJ	100 U	190 J	190 J	1100
SEMIVOLATILES (UG/L)	2-METHYLNAPHTHALENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.24	0.26	0.6
	ACENAPHTHENE				0.1 U	0.1 U	NA	0.15	0.1	0.11	0.1 U	0.16	0.12	0.13	0.1 U	NA	NA	0.1 U	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	BENZALDEHYDE				10 UJ	10 UJ	NA	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U	10 UJ	NA	NA	10 UJ	10 UJ	1.6 J	10 UJ	10 UJ	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ
	BIS(2-ETHYLHEXYL)PHTHALATE	6	6		10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.4 J	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.1 J	10 U
	LOW MOLECULAR WEIGHT PAHS				0.1 U	0.1 U	NA	0.15	0.1	0.11	NA	0.16	0.12	NA	0.1 U	NA	NA	0.1 U	0.1	NA	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	NA	0.72 J	0.71 J	1.34
	NAPHTHALENE				0.1 U	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.48 J	0.45 J	0.74
	TOTAL PAHS				0.1 U	0.1 U	NA	0.15	0.1	0.11	NA	0.16	0.12	NA	0.1 U	NA	NA	0.1 U	0.1 J	NA	0.1 U	0.1 U	NA	NA	0.1 U	0.1 U	NA	0.72 J	0.71 J	1.34
EPH MADEP (UG/L)	C11-C22 AROMATICS		200		NA	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	NA	100 UJ	100 UJ	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 UJ
HERBICIDES (UG/L)	MCPA				NA	100 U	NA	100 U	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
METALS (UG/L)	ALUMINUM				1930	256 U	653	37 U	56 U	56 U	56 U	37 U	56 U	56 U	37 U	68 UJ	56 U	37 U	56 U	56 U	37 U	56 U	56 U	56 U	56 U	37 U	56 U	56 U	37 U	37 U	56 U
	ARSENIC	10	10	10	2.5 U	5.3 U	5.3 U	5.1 J	5.3 U	5.3 U	8 J	4.1 J	6.1 J	8.5 J	2.5 U	5.3 U	5.3 U	2.5 U	5.3 U	5.3 U	2.5 U	5.3 U	8.4 J	5.3 U	2.7 J	5.3 U	5.3 U	2.5 U	2.5 U	5.3 U
	BARIUM	2000	2000		78 J	62.3 J	68.5 J	73.4 J	85.3 J	84.6 J	74 J	85.6 J	98.2 J	84.8 J	34.3 J	26.1 J	18.6 J	196 J	208	197 J	51.5 J	69.4 J	59.1 J	56.7 J	170 J	173 J	161 J	59 J	62.3 J	79.9 J
	BERYLLIUM	4	4		0.11 J	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.13 U	0.069 J	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.051 U	0.13 U
	CADMIUM	5	5		0.95 UJ	0.35 UJ	0.14 U	4.1 J	2.9 J	2.9 J	0.18 UJ	4.1 J	2.9 J	0.14 U	0.68 UJ	0.14 U	0.14 U	0.11 U	0.14 U	0.14 U	5.2	3.9 J	0.33 UJ	0.26 UJ	1.4 UJ	1.1 J	0.14 U	3.3 J	3.5 J	2.9 J
	CALCIUM				6460	6610	6800	27000	27700	27300	27000	26700	28000	27300	12700	21100	20100	213000	192000	186000	30500	30700	29000	28400	72800	64100	54300	31000	31300	26500
	CHROMIUM	100	100		0.25 UJ	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	1.1 U	0.22 U	1.1 U	1.1 U	0.22 U	0.22 U	1.1 U
	COBALT				27.8 J	16.9 J	14.8 J	5.9 J	4.6 J	4.4 J	4.3 J	5.7 J	4.3 J	4.1 J	3.9 J	1.2 U	1.2 U	2 UJ	1.2 U	1.2 U	1.3 UJ	1.2 U	1.2 U	1.2 U	48.6 J	41.1 J	37.3 J	2.1 J	2.5 J	1.2 U
	CYANIDE	200	200		2.4 U	2.4 U	NA	3.3 J	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.8 J	2.4 U	2.4 U	2.4 U	6.3 J	8 J	2.4 U	2.4 U	2.4 U	2.4 U
	IRON				9240	5240	8220	47300	45100	44600	45700	44700	43000	45400	9190	2110	137 J	25500	21000	20000	61100	57300	59000	56700	23900	25500	25700	38800	39400	43300
	MAGNESIUM				2640	2550	2510	6720	6730	6650	6480	6450	6530	6370	804	1590	1470	15300	14400	13500	7140	7190	6920	6650	15000	13000	10300	7850	7900	6930
	MANGANESE			313	[redacted]																									
	NICKEL				2.1 UJ	1.5 U	2.3 J	2.4 UJ	1.5 U	1.5 U	2.6 J	1.7 UJ	1.5 U	1.5 U	3.7 UJ	1.5 U	1.5 U	1 UJ	1.5 U	1.5 U	0.73 UJ	1.5 U	1.5 U	1.5 U	3.3 UJ	1.5 U	2.1 J	0.83 UJ	1.7 UJ	1.5 U
	POTASSIUM				1550	1500	1530	2040	2040	1980	2010	2170	2460	2190	1350	2340	3210	9730	11100	11000	2430	2640	2940	2900	2360	2120	2300	1960	1930	1680
	SELENIUM	50	50		5.2 U	6.6 U	6.6 U	5.2 U	6.6 U	6.6 U	12.7 J	5.2 U	6.6 U	7.5 J	5.2 U	6.6 U	6.6 U	5.3 J	6.6 U	6.6 U	5.2 U	6.6 U	11.1 J	11.9 J	5.2 U	6.6 U	14 J	5.2 U	5.2 U	6.6 U
	SODIUM				42800	40100	45700	5890	5770	5610	5560	5890	5890	5590	4810	4310	3070	25600	23400	20800	5230	5360	5700	5510	18300	15600	13300	6670	6740	5840
	THALLIUM	2	2		2.8 U	1 U	1 U	[redacted]	1 U	1 U	1 U	[redacted]	1 U	1 U	2.8 U	1 U	NA	2.8 U	1 U	1 U	[redacted]	1 U	1 U	1 U	[redacted]	1 U	1 U	[redacted]	[redacted]	1 U
	VANADIUM				1 J	0.96 U	0.96 U	1.8 J	0.96 U	0.96 U	0.99 J	1.9 J	0.96 U	1.1 J	0.4 U	0.96 U	2.6 J	1.6 J	0.96 U	0.96 U	1.8 J	0.96 U	0.96 U	0.96 U	0.42 J	0.96 U	0.96 U	1.5 J	1.6 J	0.96 U
	ZINC				21.3 UJ	15.6 J	16.3 UJ	19.6 UJ	11.5 J	10.5 J	12.4 UJ	20.6 UJ	13.7 J	9.9 UJ	20.6 UJ	20.6 J	18.7 UJ	14.6 UJ	13.1 J	16.1 UJ	20.6 UJ	10.4 J	19.2 UJ	14.5 UJ	12.6 UJ	9.8 J	7.7 U	18 UJ	19.6 UJ	11.4 J
DISSOLVED METALS (UG/L)	ALUMINUM				169 J	NA	NA	37 U	56 U	56 U	56 U	37 U	56 U	56 U	37 U	NA	56 U	37 U	56 U	56 U	37 U	56 U	56 U	56 U	56 U	37 U	56 U	56 U	49 J	42.9 J	56 U
	ARSENIC	10	10	10	2.5 U	NA	NA	5.1 J	8 J	5.3 U	8.9 J	2.7 J	6.9 J	6.5 J	2.5 U	NA	5.3 U	2.5 U	5.3 U	5.3 U	2.5 U	5.3 U	6 J	5.3 U	2.5 U	5.3 U	5.3 U	2.5 U	2.5 U	5.3 U
	BARIUM	2000	2000		62.2 J	NA	NA	72.3 J	86.3 J	85.6 J	73.4 J	84.9 J	99.7 J	82.6 J	32.3 J	NA	18.1 J	183 J	205	205	51.2 J	69 J	58.7 J	57.1 J	167 J	180 J	165 J	57.2 J	60.1 J	79.7 J
	BERYLLIUM	4	4		0.051 U	NA	NA	0.051 U	0.13 U	0.13 U	0.13 U	0.056 J	0.13 U	0.13 U	0.051 U	NA	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.061 J	0.13 U
	CADMIUM	5	5		0.66 J	NA	NA	4.2 J	2.8 J	2.8 J	0.14 U	4.1 J	2.7 J	0.36 UJ	0.99 J	NA	0.14 U	0.11 U	0.14 U	0.14 U	[redacted]	3.6 J	0.23 UJ	0.14 U	1 J	1 J	0.14 U	3.5 J	3.5 J	2.6 J
	CALCIUM				6270	NA	NA	27000	28000	28000	27100	26800	28500	26900	12200	NA	20900	209000	186000	187000	31100	31500	28700	30800	73000	66100	55400	30800	31000	26500
	COBALT				26.9 J	NA	NA	6.1 J	4.2 J	4.4 J	4.2 J	6.1 J	4.2 J	4.1 J	4.1 J	NA	1.2 U	2.1 UJ	1.2 U	1.2 U	1.4 UJ	1.2 U	1.2 U	1.2 U	48.7 J	42.5 J	37.8 J	2.2 UJ	2.8 J	1.2 U
	IRON				6780	NA	NA	46100	45400	45300	45900	44500	43700	44900	10200	NA	167 J	25700	20300	20700	61600	56900	58600	58100	24100	26100	26300	39000	38400	42900
	LEAD	15	15		1.2 U	NA	NA	1.2 U	2.2 U	2.2 U	2.2 U	1.2 U	2.2 U	2.2 U	1.2 U	NA	2.2 U	1.2 U	2.2 U	2.2 U	1.2 U	2.2 U	2.2 U	2.2 U	1.2 U	2.2 U	2.2 U	1.2 J	1.2 U	2.2 U
	MAGNESIUM				2310	NA	NA	6680	6770	6790	6480	6440	6690	6370	772	NA	1540	15100	14000	13300	7250	7230	6960	6900	14900	13400	10600	7850	7650	6930
	MANGANESE			313	[redacted]	NA	NA	[redacted]								NA														
	NICKEL				1.8 J	NA	NA	2.4 J	1.5 UJ	1.5 UJ	2.1 J	1.9 J	1.5 UJ	1.5 U	3.9 J	NA	1.5 U	1.1 UJ	2.7 J	2.1 J	0.59 UJ	1.5 UJ	1.5 U	1.5 U	3.5 J	1.5 UJ	2.2 J	1.3 UJ	1.5 UJ	1.5 UJ
	POTASSIUM				1480	NA	NA	2020	2020	2030	2040	2160	2490	2190	1270	NA	3330	9310	11000	11400	2440	2660	2930	3090	2300	2160	2300	1890	1860	1680
	SELENIUM	50	50		5.2 U	NA	NA	5.2 U	6.6 U	6.6 U	11.3 J	5.2 U	6.6 U	16.1 J	5.2 U	NA	6.6 U	5.2 U	6.6 U	7.5 J	5.2 U	6.6 U	14 J	15.5 J	5.2 U	6.6 U	7.1 J	5.2 U	5.2 U	6.6 U
	SODIUM				42400	NA	NA	5840	5750	5810	5610	5910	6000	5570	4730	NA	3210	24700	23300	21500	5280	5330	5680	5700	17900	15900	13300	6670	6670	5870
	THALLIUM	2	2		2.8 U	NA	NA	[redacted]	NA	NA	NA	[redacted]	NA	NA	2.8 U	NA	NA	[redacted]	NA	NA	[redacted]	NA	NA	NA	[redacted]	NA	NA	[redacted]	[redacted]	NA
	VANADIUM				0.4 U	NA	NA	1.6 J	0.96 U	0.96 U	1 J	1.8 J	0.96 U	1.1 J	0.4 U	NA	2.4 J	1.7 J	0.96 U	1.3 J	1.8 J	0.96 U	0.96 U	0.96 U	0.5 J	0.96 U	0.96 U	1.6 J	1.6 J	0.96 U
	ZINC				19.2 J	NA	NA	18.4 J	14 J	13.2 J	11.2 UJ	18.3 J	14.1 J	11.2 UJ	24.3 J	NA	13.7 UJ	11.8 UJ	25.9 J	18.8 UJ	18.9 J	16.3 J	14 UJ	12 UJ	15.3 UJ	16.3 J	7.7 U	19.2 J	24.1 J	11.4 J
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY				NA	NA	NA	210	130	120	150	190	130	170	57	NA	NA	620	160	650	210	150	200	200	220	180	210	190	180	150
	CHEMICAL OXYGEN DEMAND				20 U	20 U	23	20	40	39	28	24	40	31	20 U	20 U	20 U	47	60	65	36	50	40	38	20 U	28	22	28	27	42
	CHLORIDE	250			NA	NA	NA	5.6	6.3	6.2	7.7	5.7	6.1	7.8	3	NA	NA	12	11	9.8	13	14	14	14	15	16	14	16	16	16
	FERROUS IRON				NA	NA	NA	32	27	23	2.47	28	25	0.86	8.3	NA	NA	22	15.7	15.5	42	41	41 J	1.94 J	19.8	23.4	2.05	31.8	32.6	30
	NITRATE-N	10			NA	NA	NA	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.31	NA	NA	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
	SULFATE	250			NA	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	8.1	NA	NA	67	5.9	5 U	5 U	5 U	5 U	5 U	140	96	82	6.6	6.5	5 U
	TOTAL DISSOLVED SOLIDS				NA	NA	NA	170	200	170	150	170	200	150	40 U	NA	NA	710	660	320	170	200	170	170	420	370	320	190	180	190

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-6
RDA GROUNDWATER ANALYTICAL RESULTS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS
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FRACTION (UNITS)	SAMPLE_ID	MCL	MMCL	ROD_RG	RDA-GW-TT05-0908	RDA-GW-TT06-0408	RDA-GW-TT06-0608	RDA-GW-TT06-0908	RDA-GW-TT07-0408	RDA-GW-TT07-0608	RDA-GW-TT07-0908
	LOCATION_ID				RDA-TT05	RDA-TT06	RDA-TT06	RDA-TT06	RDA-TT07	RDA-TT07	RDA-TT07
	SAMPLE_DATE				09/11/08	04/09/08	06/15/08	09/10/08	04/10/08	06/13/08	09/11/08
	SACODE										
VOLATILES (UG/L)	BTEX				NA	1 U	1 U	NA	1 U	1 U	NA
	CHLOROBENZENE	100	100		43	1 U	1 U	1 U	1 U	1 U	1 U
	CYCLOHEXANE				4.1	1 U	1 U	1 U	1 U	1 U	1 U
	ISOPROPYLBENZENE				1.8	1 U	1 U	1 U	1 U	1 U	1 U
	METHYL CYCLOHEXANE				5	1 U	1 U	1 U	1 U	1 U	1 U
	TOLUENE	1000	1000		1 U	1 U	1 U	1 U	1 U	1 U	1 U
	TOTAL CHLORINATED VOCS				NA	0.96 UJ	0.96 UJ	NA	0.96 UJ	0.96 UJ	NA
VPH MADEP (UG/L)	C5-C8 ALIPHATICS		300		130	100 U	100 U	100 U	210 J	180	140
SEMIVOLATILES (UG/L)	2-METHYLNAPHTHALENE				0.24	0.1 U	0.1 U	0.1 U	0.12	0.1 U	0.1 U
	ACENAPHTHENE				0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	BENZALDEHYDE				10 U	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U
	BIS(2-ETHYLHEXYL)PHTHALATE	6	6		10 U	10 U	10 U	10 U	10 U	10 U	10 U
	LOW MOLECULAR WEIGHT PAHS				NA	0.1 U	0.1 U	NA	0.24	0.1 U	NA
	NAPHTHALENE				0.26	0.1 U	0.1 U	0.1 U	0.12	0.1 U	0.1 U
	TOTAL PAHS				NA	0.1 U	0.1 U	NA	0.24	0.1 U	NA
EPH MADEP (UG/L)	C11-C22 AROMATICS		200		100 U	100 UJ	100 U	130	100 U	100 U	100 U
HERBICIDES (UG/L)	MCPA				100 U	100 U	100 U	250	100 U	100 U	100 U
METALS (UG/L)	ALUMINUM				56 U	255	142 UJ	244	37 U	56 U	56 U
	ARSENIC	10	10	10	5.3 U	2.5 U	5.3 U	5.3 U	4.3 J	5.3 U	5.3 U
	BARIUM	2000	2000		76.7 J	46 J	19 J	63.8 J	57.5 J	79 J	75.9 J
	BERYLLIUM	4	4		0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U
	CADMIUM	5	5		0.17 UJ	0.11 U	0.14 U	0.14 U	5.5	4.2 J	0.14 U
	CALCIUM				29200	22200	6200	29100	19700	18300	19800
	CHROMIUM	100	100		1.1 U	0.58 UJ	1.3 J	1.1 U	0.22 U	1.1 U	1.1 U
	COBALT				1.2 U	1.2 UJ	1.2 U	1.2 U	1 UJ	1.2 U	1.2 U
	CYANIDE	200	200		2.4 U	5.6 J	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
	IRON				46800	2460	1160	3120	61200	60300	66400
	MAGNESIUM				7200	4170	2570	4780	6820	7240	7370
	MANGANESE			313	11000	248	93.5	283	10900	11300	11500
	NICKEL				1.5 U	1.7 UJ	1.5 U	1.9 J	0.61 UJ	1.5 U	1.5 U
	POTASSIUM				1890	3980	2010	4060	1290	1210	1400
	SELENIUM	50	50		13.8 J	5.2 U	6.6 U	6.6 U	5.2 U	6.6 U	9.5 J
	SODIUM				6820	8210	9600	14400	5230	5100	5310
	THALLIUM	2	2		1 U	2.8 U	1 U	1 U	5.7 J	1 U	1 U
	VANADIUM				1.2 J	0.9 J	0.96 U	0.96 U	1.3 J	0.96 U	0.96 U
	ZINC				15.2 UJ	18.9 UJ	25.1 J	13.6 UJ	17 UJ	11.5 J	9.6 UJ
DISSOLVED METALS (UG/L)	ALUMINUM				56 U	267	108 UJ	220	61.1 J	56 U	56 U
	ARSENIC	10	10	10	5.3 U	2.5 U	5.3 U	5.3 U	4.5 J	5.3 U	5.4 J
	BARIUM	2000	2000		75.2 J	43.8 J	19.6 J	62.9 J	54.9 J	78.8 J	68.9 J
	BERYLLIUM	4	4		0.13 U	0.051 U	0.13 U	0.13 U	0.051 U	0.13 U	0.13 U
	CADMIUM	5	5		0.16 UJ	0.11 U	0.14 U	0.14 U	5.6	3.9 J	0.25 J
	CALCIUM				29000	22200	6350	28700	19300	18400	19600
	COBALT				1.2 U	1.4 UJ	1.2 U	1.2 U	1.3 UJ	1.2 U	1.2 U
	IRON				46800	2430	970	3410	60200	59900	64200
	LEAD	15	15		2.2 U	1.9 J	2.2 U	2.2 U	1.2 U	2.2 U	2.2 U
	MAGNESIUM				7200	4200	2630	4800	6820	7230	7240
	MANGANESE			313	10900	246	94.9	284	10900	11300	11400
	NICKEL				1.5 U	1.6 UJ	1.5 UJ	1.6 J	0.63 UJ	1.5 UJ	1.5 U
	POTASSIUM				1900	3860	2080	4060	1250	1210	1440
	SELENIUM	50	50		13.3 J	5.2 U	6.6 U	6.6 U	5.2 U	6.6 U	12.7 J
	SODIUM				6850	8150	9610	14600	5130	5100	5310
	THALLIUM	2	2		NA	2.8 U	NA	NA	6.3 J	NA	NA
	VANADIUM				1.1 J	0.99 J	1.4 J	0.96 U	1.5 J	0.96 U	0.96 U
	ZINC				12.2 UJ	22.2 J	17.8 J	17.9 UJ	18.1 J	16.9 J	12.8 UJ
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY				180	68	66	86	160	100	180
	CHEMICAL OXYGEN DEMAND				35	42	110	20 U	23	45	44
	CHLORIDE	250			14	4.9	12	23	14	14	13
	FERROUS IRON				1.87	2.08	0.98	2.83	40	41	1.95
	NITRATE-N	10			0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
	SULFATE	250			11	23	5 U	20	5 U	5 U	5 U
	TOTAL DISSOLVED SOLIDS				180	150	100 U	220	170	160	160

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE; J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-7
RDA SURFACE WATER ANALYTICAL SUMMARY STATISTICS - 2007
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NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
VOLATILE ORGANIC COMPOUNDS (UG/L)			
CHLOROBENZENE	3/18	19-20	2 max samples
CYCLOHEXANE	2/18	5.8-6.2	RDA-SW-SW03-0607
ISOPROPYLBENZENE	2/18	0.45-0.47	RDA-SW-SW03-0607
TOLUENE	4/18	0.49-7.7	RDA-SW-SW02-0607
VPH (UG/L)			
C5-C8 ALIPHATICS	2/18	130-130	2 max samples
SEMIVOLATILE ORGANIC COMPOUNDS (UG/L)			
2,4-DINITROPHENOL	2/18	1.9-3.4	RDA-SW-SWD-1207
4,6-DINITRO-2-METHYLPHENOL	1/18	0.21-0.21	RDA-SW-SWD-0907
4-CHLOROANILINE	1/17	2-2	RDA-SW-SWU-1207
4-METHYLPHENOL	4/18	2-12	RDA-SW-SW02-0607
ACENAPHTHENE	4/18	0.11-0.13	RDA-SW-SW01-0907
BENZO(B)FLUORANTHENE	1/18	0.1-0.1	RDA-SW-SW03-0607-D
BIS(2-ETHYLHEXYL)PHTHALATE	3/18	1-2	RDA-SW-SW02-1207-D
CAPROLACTAM	1/18	2-2	RDA-SW-SWD-0907
FLUORANTHENE	1/18	0.12-0.12	RDA-SW-SW03-0607-D
PENTACHLOROPHENOL	1/18	0.18-0.18	RDA-SW-SWD-0907
PHENOL	2/18	2-2	2 max samples
EPH (UG/L)			
C11-C22 AROMATICS	4/18	120-240	RDA-SW-SW03-0607-D
PESTICIDES/PCBs			
4,4'-DDD	2/18	0.013-0.03	RDA-SW-SW03-0607
4,4'-DDE	3/18	0.024-0.11	RDA-SW-SW03-0607-D
4,4'-DDT	3/17	0.019-0.031	RDA-SW-SW03-0607-D
ALDRIN	1/18	0.031-0.031	RDA-SW-SW03-0607-D
ALPHA-CHLORDANE	2/18	0.082-0.13	RDA-SW-SW03-0607-D
AROCLOR-1260	2/18	0.24-0.24	2 max samples
DELTA-BHC	1/18	0.012-0.012	RDA-SW-SW01-1207
DIELDRIN	2/18	0.12-0.15	RDA-SW-SW03-0607-D
ENDRIN ALDEHYDE	1/18	0.042-0.042	RDA-SW-SW02-0607
ENDRIN KETONE	2/18	0.02-0.04	RDA-SW-SW02-0607
GAMMA-CHLORDANE	1/18	0.08-0.08	RDA-SW-SW03-0607
HEPTACHLOR	1/18	0.01-0.01	RDA-SW-SW03-1207
HERBICIDES (UG/L)			
DICAMBA	2/18	0.23-0.46	RDA-SW-SWD-0907
MCPA	1/18	1300-1300	RDA-SW-SWD-0907
MCPP	1/18	670-670	RDA-SW-SWD-0907
TOTAL METALS (UG/L)			
ALUMINUM	11/18	105-23200	RDA-SW-SW01-0607
ARSENIC	3/18	4.4-6.6	RDA-SW-SW03-0607-D
BARIUM	18/18	30.9-483	RDA-SW-SW01-0607
BERYLLIUM	1/18	1.3-1.3	RDA-SW-SW01-0607
CADMIUM	1/18	2.5-2.5	RDA-SW-SW01-0607
CALCIUM	18/18	12700-256000	RDA-SW-SW01-1207
CHROMIUM	3/18	12.2-13.2	RDA-SW-SW01-0607
COBALT	10/18	1-5.9	RDA-SW-SW01-0607
COPPER	15/18	1.1-25.6	RDA-SW-SW03-0607-D
IRON	18/18	238-66600	RDA-SW-SW01-0607

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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
LEAD	12/18	1-180	RDA-SW-SW03-0607-D
MAGNESIUM	18/18	3360-19000	RDA-SW-SW02-1207-D
MANGANESE	18/18	438-18800	RDA-SW-SW03-0607
NICKEL	18/18	1-13.3	RDA-SW-SW01-0607
POTASSIUM	17/18	2060-14700	RDA-SW-SW01-0607
SODIUM	18/18	5190-65700	RDA-SW-SWU-0907
VANADIUM	9/18	1-59.3	RDA-SW-SW01-0607
ZINC	15/18	16.3-383	RDA-SW-SW01-0607
FILTERED METALS (UG/L)			
ALUMINUM	2/18	362-5050	RDA-SW-SW03-0607-D
ARSENIC	2/18	1-2.5	RDA-SW-SW03-0607-D
BARIUM	18/18	26.5-184	RDA-SW-SW01-0907
CALCIUM	18/18	11800-268000	RDA-SW-SW01-1207
CHROMIUM	2/18	4.3-24.9	RDA-SW-SW03-0607
COBALT	6/18	1.2-2.9	RDA-SW-SW03-1207
COPPER	11/18	1.2-8.4	RDA-SW-SW03-0607-D
IRON	16/18	136-36100	RDA-SW-SW03-1207
LEAD	2/18	3.4-45.7	RDA-SW-SW03-0607-D
MAGNESIUM	18/18	3410-18800	RDA-SW-SW01-1207
MANGANESE	18/18	423-15700	RDA-SW-SW03-1207
NICKEL	17/18	1.3-11.5	RDA-SW-SW03-0607
POTASSIUM	15/18	2060-13600	RDA-SW-SW01-1207
SODIUM	18/18	4070-66500	RDA-SW-SWU-0907
VANADIUM	3/18	1.1-5.9	RDA-SW-SW03-0607-D
ZINC	17/18	13.3-130	RDA-SW-SWD-0907
MISCELLANEOUS PARAMETERS (MG/L)			
ALKALINITY	15/18	29-820	RDA-SW-SW01-1207
CHEMICAL OXYGEN DEMAND	13/18	20-100	RDA-SW-SW03-0607
CHLORIDE	18/18	2.1-110	RDA-SW-SWU-1207
FERROUS IRON	18/18	0.14-29	RDA-SW-SW01-0607
NITRATE	2/6	0.17-0.22	RDA-SW-SWU-0607
NITRATE-N	6/12	0.13-0.18	RDA-SW-SWU-0907
SULFATE	15/18	6.1-300	RDA-SW-SW02-1207
TOTAL DISSOLVED SOLIDS	18/18	180-880	RDA-SW-SW01-1207

TABLE 2-8
RDA SURFACE WATER ANALYTICAL SUMMARY STATISTICS - 2008
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
VOLATILE ORGANIC COMPOUNDS (UG/L)			
BTEX	3/12	0.46-2.4	RDA-SW-SW03-0608
CARBON DISULFIDE	1/18	0.32-0.32	RDA-SW-SW03-0608
CHLOROBENZENE	3/18	5.7-25	RDA-SW-SW03-0408
CYCLOHEXANE	1/18	2.6-2.6	RDA-SW-SW03-0408
ISOPROPYLBENZENE	1/18	0.32-0.32	RDA-SW-SW03-0408
TOLUENE	4/18	0.46-5.4	RDA-SW-SW03-0908
TOTAL CHLORINATED VOCS	2/12	5.7-25	RDA-SW-SW03-0408
VPH (UG/L)			
C5-C8 ALIPHATICS	1/18	160-160	RDA-SW-SW03-0408
SEMIVOLATILE ORGANIC COMPOUNDS (UG/L)			
4-METHYLPHENOL	1/18	22-22	RDA-SW-SW03-0608
ACENAPHTHENE	3/18	0.12-0.17	RDA-SW-SW01-0908
BENZALDEHYDE	6/18	1.3-5.1	RDA-SW-SW02-0908
BIS(2-ETHYLHEXYL)PHTHALATE	1/18	2.5-2.5	RDA-SW-SW03-0408
CAPROLACTAM	1/18	1.1-1.1	RDA-SW-SW03-0408
FLUORENE	1/18	0.1-0.1	RDA-SW-SW01-0908
LOW MOLECULAR WEIGHT PAHS	4/12	0.12-0.24	2 max samples
NAPHTHALENE	2/18	0.24-0.24	2 max samples
PENTACHLOROPHENOL	1/18	0.64-0.64	RDA-SW-SW02-0908-D
PHENOL	1/18	9.2-9.2	RDA-SW-SW03-0608
TOTAL PAHS	4/12	0.12-0.24	2 max samples
EPH (UG/L)			
C11-C22 AROMATICS	1/18	170-170	RDA-SW-SW03-0608
C19-C36 ALIPHATICS	1/18	210-210	RDA-SW-SW03-0608
PESTICIDES/PCBS			
ENDRIN ALDEHYDE	1/18	0.15-0.15	RDA-SW-SWD-0908
GAMMA-BHC (LINDANE)	1/18	0.014-0.014	RDA-SW-SW03-0908
HEPTACHLOR EPOXIDE	2/18	0.046-0.049	RDA-SW-SW01-0608
TOTAL METALS (UG/L)			
ALUMINUM	15/18	52.2-24400	RDA-SW-SW03-0608
ARSENIC	6/18	0.329-10.2	RDA-SW-SW03-0608
BARIUM	18/18	30.5-411	RDA-SW-SW03-0608
BERYLLIUM	4/18	0.025-0.096	RDA-SW-SW03-0408
CADMIUM	2/18	0.072-0.098	RDA-SW-SW03-0408
CALCIUM	18/18	9910-227000	RDA-SW-SW01-0408
CHROMIUM	2/18	2.2-23.7	RDA-SW-SW03-0608
COBALT	17/18	0.201-7.5	RDA-SW-SW03-0608
COPPER	17/18	0.672-42.4	RDA-SW-SW03-0608
IRON	18/18	220-85400	RDA-SW-SW03-0908
LEAD	16/18	0.389-228	RDA-SW-SW03-0608
MAGNESIUM	18/18	2360-16500	RDA-SW-SW01-0408
MANGANESE	18/18	101-34400	RDA-SW-SW03-0608
NICKEL	18/18	1.1-13.5	RDA-SW-SW03-0608
POTASSIUM	16/18	2060-12800	RDA-SW-SW01-0608
SELENIUM	3/18	0.17-0.404	RDA-SW-SW03-0408
SILVER	2/18	0.044-0.406	RDA-SW-SWD-0908
SODIUM	18/18	6650-62900	RDA-SW-SWU-0608
THALLIUM	1/18	0.091-0.091	RDA-SW-SWD-0408
VANADIUM	10/18	0.534-36.9	RDA-SW-SW03-0608
ZINC	13/18	12.1-243	RDA-SW-SW03-0608

TABLE 2-8
RDA SURFACE WATER ANALYTICAL SUMMARY STATISTICS - 2008
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
FILTERED METALS (UG/L)			
ALUMINUM	4/18	29.8-349	RDA-SW-SW03-0608
ARSENIC	2/18	0.44-1.3	RDA-SW-SW03-0608
BARIUM	18/18	26.4-238	RDA-SW-SW01-0908
BERYLLIUM	1/18	0.021-0.021	RDA-SW-SWU-0908
CADMIUM	1/18	5.6-5.6	RDA-SW-SWU-0608
CALCIUM	18/18	8510-217000	RDA-SW-SW01-0908
COBALT	17/18	0.182-2.8	RDA-SW-SW03-0908
COPPER	9/18	0.409-1.4	RDA-SW-SWD-0408
IRON	18/18	78.9-49500	RDA-SW-SW03-0908
LEAD	9/18	0.041-3.2	RDA-SW-SW03-0608
MAGNESIUM	18/18	2370-15400	RDA-SW-SW01-0908
MANGANESE	18/18	71.3-28100	RDA-SW-SW02-0608-D
NICKEL	18/18	1.1-4.4	RDA-SW-SW01-0408
POTASSIUM	16/18	1930-11800	RDA-SW-SW01-0908
SELENIUM	1/18	0.154-0.154	RDA-SW-SW01-0908
SODIUM	18/18	5590-56900	RDA-SW-SWU-0608
ZINC	7/18	8.5-39	RDA-SW-SWD-0408
MISCELLANEOUS PARAMETERS (MG/L)			
ALKALINITY	16/18	34-730	RDA-SW-SW01-0408
CHEMICAL OXYGEN DEMAND	16/18	27-200	RDA-SW-SW03-0608
CHLORIDE	18/18	3.6-110	RDA-SW-SWU-0608
CYANIDE	3/18	2.7-10.2	RDA-SW-SW03-0608
FERROUS IRON	17/18	0.03-29.4	RDA-SW-SW01-0408
NITRATE-N	6/18	0.14-0.28	RDA-SW-SWU-0408
SULFATE	11/18	5.2-38	RDA-SW-SW01-0408
TOTAL DISSOLVED SOLIDS	18/18	140-770	RDA-SW-SW01-0908

TABLE 2-9
RDA SURFACE WATER ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS
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FRACTION (UNITS)	SAMPLE_ID	NRWQC	RDA-SW-SW01-0607	RDA-SW-SW01-0907	RDA-SW-SW01-1207	RDA-SW-SW02-0607	RDA-SW-SW02-0907	RDA-SW-SW02-0907-D	RDA-SW-SW02-1207	RDA-SW-SW02-1207-D	RDA-SW-SW03-0607	RDA-SW-SW03-0607-D	RDA-SW-SW03-0907	RDA-SW-SW03-1207	RDA-SW-SWD-0607	RDA-SW-SWD-0907	RDA-SW-SWD-1207	RDA-SW-SWU-0607	RDA-SW-SWU-0907	RDA-SW-SWU-1207
	LOCATION_ID		RDA-SW01	RDA-SW01	RDA-SW01	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW03	RDA-SW03	RDA-SW03	RDA-SW03	RDA-SWD	RDA-SWD	RDA-SWD	RDA-SWU	RDA-SWU	RDA-SWU
	SAMPLE_DATE		06/13/07	09/13/07	12/05/07	06/12/07	09/12/07	09/12/07	12/05/07	12/05/07	06/13/07	06/13/07	09/12/07	12/05/07	06/14/07	09/12/07	12/04/07	06/14/07	09/13/07	12/04/07
	QC_TYPE							DUPLICATE		DUPLICATE		DUPLICATE								
VOLATILES (UG/L)	CHLOROBENZENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	20	19	0.5 U	20	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	CYCLOHEXANE		0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	6.2	5.8	0.5 UJ	1 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ
	ISOPROPYLBENZENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.47 J	0.45 J	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	TOLUENE		0.49 J	0.5 U	0.5 U	7.7	0.5 U	0.5 U	0.5 U	0.5 U	5.4	5.2	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VPH MADEP (UG/L)	C5-C8 ALIPHATICS		100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	130	130	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
SEMIVOLATILES (UG/L)	2,4-DINITROPHENOL		0.5 UJ	20 UJ	1 UJ	0.5 UJ	20 UJ	20 UJ	1 UJ	1 UJ	0.5 UJ	0.5 UJ	20 UJ	1 UJ	0.5 UJ	1.9 J	3.4 J	0.5 UJ	20 UJ	1 UJ
	4,6-DINITRO-2-METHYLPHENOL		1 UJ	0.1 UJ	1 UJ	1 UJ	0.1 UJ	0.1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	0.1 UJ	1 UJ	1 UJ	0.21 J	1 UJ	1 UJ	0.1 UJ	1 UJ
	4-CHLOROANILINE		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UR	10 U	10 UJ	10 U	10 U	2 J
	4-METHYLPHENOL		10 U	10 U	2 J	12	10 U	10 U	10 U	10 U	5 J	5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	ACENAPHTHENE		0.11 J	0.13	0.12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.12	0.1 U	0.1 U	0.1 U
	BENZO(B)FLUORANTHENE		0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	BIS(2-ETHYLHEXYL)PHTHALATE		1 U	1 U	1 U	1 U	1 U	1 U	1 U	2	1 U	1 U	1 U	1	1 U	1 U	1	1 U	2 U	1 U
	CAPROLACTAM		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 J	10 U	10 U	10 U	10 U
	FLUORANTHENE		0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	PENTACHLOROPHENOL	15	1 U	20 U	1 U	1 U	20 U	20 U	1 U	1 U	1 U	1 U	20 U	1 U	1 U	0.18 J	1 U	1 U	20 U	1 U
	PHENOL		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 J	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	HIGH MOLECULAR WEIGHT PAHS		0.19 UJ	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.22	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
	LOW MOLECULAR WEIGHT PAHS		0.11 J	0.13	0.12	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.12	0.23 U	0.23 U	0.23 U
	TOTAL PAHS		0.11 J	0.13	0.12	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.22	0.21 U	0.21 U	0.21 U	0.21 U	0.12	0.21 U	0.21 U	0.21 U
EPH MADEP (UG/L)	C11-C22 AROMATICS		100 U	120	130 U	130	100 U	100 U	100 U	100 U	130 J	240 J	100 U	100 U	100 U	100 U	170 U	100 U	100 U	750 U
HERBICIDES (UG/L)	DICAMBA		0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.46 J	0.1 UJ	0.1 U	0.23 J	0.1 UJ
	MCPA		100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	1300 J	100 U	100 U	100 U	100 U
	MCPP		100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	670 J	100 U	100 U	100 U	100 U
PESTICIDES/PCBS (UG/L)	4,4'-DDD		0.013 J	0.02 U	0.02 U	0.06 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.03 J	0.06 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	4,4'-DDE		0.018 UJ	0.02 U	0.02 U	0.024 J	0.02 U	0.02 U	0.02 U	0.02 U	0.069 J	0.11	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	4,4'-DDT	0.001	0.06 UR	0.02 U	0.02 U	0.024 J	0.02 U	0.02 U	0.02 U	0.02 U	0.049 J	0.031 J	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U
	TOTAL DDD/DDE/DDT		0.013 J	0.02 U	0.02 U	0.048 J	0.02 U	0.02 U	0.02 U	0.02 U	0.118 J	0.141 J	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U
	ALDRIN		0.03 U	0.01 U	0.01 U	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03 U	0.031 J	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	ALPHA-CHLORDANE	0.0043	0.03 U	0.01 U	0.01 U	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	0.062 J	0.15	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	DELTA-BHC		0.03 U	0.01 U	0.012	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03 U	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	DIELDRIN	0.056	0.06 U	0.02 U	0.02 U	0.06 U	0.02 U	0.02 U	0.02 U	0.02 U	0.12	0.15	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	ENDRIN ALDEHYDE		0.06 U	0.02 U	0.02 U	0.042 J	0.02 U	0.02 U	0.02 U	0.02 U	0.06 U	0.06 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	ENDRIN KETONE		0.06 U	0.02 U	0.02 U	0.04 J	0.02 U	0.02 U	0.02 U	0.02 U	0.06 U	0.06 U	0.02 U	0.02 U	0.02 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	GAMMA-CHLORDANE	0.0043	0.03 U	0.01 U	0.01 U	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	0.06	0.2 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	HEPTACHLOR	0.0038	0.03 U	0.01 U	0.01 U	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03 U	0.03 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	PCBS - AROCLOR-1260	0.014	0.2 U	0.2 U	0.2 U	0.24	0.2 U	0.2 U	0.2 U	0.2 U	0.32	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED;

TABLE 2-9
RDA SURFACE WATER ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS
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FRACTION (UNITS)	SAMPLE_ID / LOCATION_ID / SAMPLE_DATE / QC_TYPE	NRWQC	RDA-SW-SW01-0607 / RDA-SW01 / 06/13/07	RDA-SW-SW01-0907 / RDA-SW01 / 09/13/07	RDA-SW-SW01-1207 / RDA-SW01 / 12/05/07	RDA-SW-SW02-0607 / RDA-SW02 / 06/12/07	RDA-SW-SW02-0907 / RDA-SW02 / 09/12/07	RDA-SW-SW02-0907-D / RDA-SW02 / 09/12/07 / DUPLICATE	RDA-SW-SW02-1207 / RDA-SW02 / 12/05/07	RDA-SW-SW02-1207-D / RDA-SW02 / 12/05/07 / DUPLICATE	RDA-SW-SW03-0607 / RDA-SW03 / 06/13/07	RDA-SW-SW03-0607-D / RDA-SW03 / 06/13/07 / DUPLICATE	RDA-SW-SW03-0907 / RDA-SW03 / 09/12/07	RDA-SW-SW03-1207 / RDA-SW03 / 12/05/07	RDA-SW-SWD-0607 / RDA-SWD / 06/14/07	RDA-SW-SWD-0907 / RDA-SWD / 09/12/07	RDA-SW-SWD-1207 / RDA-SWD / 12/04/07	RDA-SW-SWU-0607 / RDA-SWU / 06/14/07	RDA-SW-SWU-0907 / RDA-SWU / 09/13/07	RDA-SW-SWU-1207 / RDA-SWU / 12/04/07
METALS (UG/L)	ALUMINUM		23200	346	3330	100 U	232	241	100 U	100 U	15600	17200	673	2350	100 U	419	100 U	105	100 U	100 U
	ARSENIC		4.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6.2	6.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	BARIUM		483	215	272	133	59.1	61.6	37.4	37.2	248	285	34.3	30.9	51.3	100	37.4	51.8	111	48.2
	BERYLLIUM		1.3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CADMIUM		2.5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	CALCIUM		197000	190000	256000	60800	90600	94400	119000	122000	51600	54500	56100	47900	13300	30300	12700	13800	31500	13600
	CHROMIUM		13.2	3 U	3 U	3 U	3 U	3 U	3 U	3 U	12.2	12.4	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
	COBALT		5.9	1 U	1.3	1.1	2.8	3	1 U	1 U	3.4	3.6	2.5	1	1 U	1 U	1 U	1 U	1.2	1 U
	COPPER		24.6	1.7	3	1 U	2.7	3.3	1 U	1 U	25	25.6	3.8	5.6	1.4	2.9	1.5	1.3	2.2	1.1
	IRON		66600	23000	42600	45300	3050	3910	1880	2350	44900	48300	1970	43700	2320	567	653	967	238	419
	LEAD		160	3.7	5.9	1 U	1.4	2.4	1 U	1 U	169	180	7.2	12.1	1	2.1	1 U	1.1	1 U	1 U
	MAGNESIUM		15100	12400	18400	7670	11400	11800	18000	19000	5170	5480	4050	4980	3360	7170	3680	3550	8110	4250
	MANGANESE		3950	3390	5490	10500	6840	7410	4220	4060	18800	18500	7760	17300	976	438	474	1170	1070	525
	NICKEL		13.3	4.3	5.7	1.1	4.3	4.7	3.3	3.3	7.5	7.2	2.2	3.9	1	2.9	1.1	1	2.4	1.2
	POTASSIUM		14700	11300	13700	2000 U	6980	6870	9410	9690	3910	4490	4090	3890	2080	2820	2060	2200	2660	2440
	SODIUM		17500	18000	21100	6120	9410	9400	23500	23800	5190	5480	6910	6420	49100	63300	42800	56000	65700	63300
	VANADIUM		59.3	2.6	3.1	1 U	1	1.6	1 U	1 U	20.3	20.7	1.8	1 U	1 U	1.6	1 U	1 U	1 U	1 U
	ZINC		383	20 U	25.4	22.1	92.5	106	20 U	20 U	208	226	114	34.4	22	123	68.7	16.3	126	27.4
DISSOLVED METALS (UG/L)	ALUMINUM	87	100 UJ	100 U	100 U	100 UJ	100 U	100 U	100 U	100 U	36.2 J	5050 J	100 U	100 U	100 UJ	100 U	100 U	100 UJ	100 U	100 U
	ARSENIC	150	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.5	1 U	1	1 U	1 U	1 U	1 U	1 U	1 U
	BARIUM		183 J	184	179	65.2 J	54.3	49.7	30.9	30.8	54.6 J	99.3 J	26.5	62.1	45.1 J	96.2	33	48.9 J	110	44.1
	CALCIUM		167000	172000	268000	53100	92100	82400	111000	114000	39000	42900	52800	45200	13300	28700	11800	13400	31700	13000
	CHROMIUM	151	3 UJ	3 U	3 U	3 UJ	3 U	3 U	3 U	3 U	24.9 J	4.3 J	3 U	3 U	3 UJ	3 U	3 U	3 UJ	3 U	3 U
	COBALT		1 U	1 U	1 U	1 U	2.7	2.4	1 U	1 U	1 U	1.5	2.2	2.9	1 U	1 U	1 U	1 U	1.2	1 U
	COPPER	18.9	1 U	1 U	1 U	4.7	1.4	1.7	1 U	1 U	1 U	8.4	2.7	1 U	2.1	2.3	1.2	1.4	2.2	1.3
	IRON	1000	25100 J	17000	35300	5120 J	577	528	190	268	14700 J	23900 J	100 U	38100	437 J	136	538	333 J	100 U	270
	LEAD	6.41	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	3.4 J	36.4 J	1 U	1 U	1 UJ	1 U	1 U	1 UJ	1 U	1 U
	MAGNESIUM		10900	11400	18800	6860	11300	10200	17100	17600	3520	4070	3650	4470	3410	6790	3470	3410	8200	4070
	MANGANESE		2920	3120	5710	7410	6890	5860	3720	3370	14500	15200	7530	15700	866	423	525	1150	1080	498
	NICKEL	109	3.1 J	3.7	4.3	2 J	3.9	4	3.5	3.4	11.5 J	3 J	2.2	1.9	1 UJ	1.9	1.4	1.3 J	2.7	1.5
	POTASSIUM		10200 J	10400	13600	2000 UJ	6910	6330	8800	8980	2000 UJ	2140 J	3700	3070	2060 J	2690	2000 U	2070 J	2750	2380
	SODIUM		15300	16900	21800	5600	9320	8430	21900	22300	4070	4410	6460	5720	49600	60700	38900	53700	66500	60400
	VANADIUM		1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 UJ	5.9 J	1 U	1 U	1 UJ	1.1	1 U	1 UJ	1.2	1 U
	ZINC	247	14.1 J	28.3 J	20 U	13.3 J	95.3	81.5	21.6	21.1	16.4 J	59.2 J	109	20.4	22.8 J	130	93.1	18.2 J	129	33.5
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY	20	660 J	510	820 J	100 J	36	35	220 J	180 J	200 J	190 J	29	160 J	40 J	20 U	40 U	44 J	20 U	29 J
	CHEMICAL OXYGEN DEMAND		82	37	64	79	23	20	21	28	100	89	34	51	21 U	21 U	21 U	20 U	20 U	22
	CHLORIDE	230	8.9	11	14	2.1	7.1	7	16	16	4.3	4.2	7.1	12	83	81	72	93	94	110
	FERROUS IRON		29	13	1.95	8.8	0.67	0.56	0.29	0.36	22.2	23.1	0.57	5.95 J	0.17	0.19	0.37	0.28	0.14	0.2
	NITRATE		0.13 U	NA	NA	0.13 U	NA	NA	NA	NA	0.13 U	0.13 U	NA	NA	0.17	NA	NA	0.22	NA	NA
	NITRATE-N		NA	0.061 U	0.13 U	NA	0.14	0.13	0.13 U	0.13 U	NA	NA	0.061 U	0.13 U	NA	0.15	0.16	NA	0.18	0.14
	SULFATE		5 U	170	5 U	5 U	250	260	300	290	6.4	6.1	150	45	6.7	110	20	6.3	120	20
	TOTAL DISSOLVED SOLIDS		610	730	880	260	480	480	630	630	200	200	320	240	210	360	180	220	380	260

BOLD AND SHADED - AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED;

TABLE 2-10
RDA SURFACE WATER ANALYTICAL RESULTS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS

FRACTION (UNITS)	SAMPLE_ID		RDA-SW-SW01-0408	RDA-SW-SW01-0608	RDA-SW-SW01-0908	RDA-SW-SW02-0408	RDA-SW-SW02-0408-D	RDA-SW-SW02-0608	RDA-SW-SW02-0608-D	RDA-SW-SW02-0908	RDA-SW-SW02-0908-D	RDA-SW-SW03-0408	RDA-SW-SW03-0608	RDA-SW-SW03-0908	RDA-SW-SWD-0408	RDA-SW-SWD-0608	RDA-SW-SWD-0908	RDA-SW-SWU-0408	RDA-SW-SWU-0608	RDA-SW-SWU-0908
	LOCATION_ID		RDA-SW01	RDA-SW01	RDA-SW01	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW03	RDA-SW03	RDA-SW03	RDA-SWD	RDA-SWD	RDA-SWD	RDA-SWU	RDA-SWU	RDA-SWU
	SAMPLE_DATE		04/08/08	06/11/08	09/08/08	04/08/08	04/08/08	06/11/08	06/11/08	09/08/08	09/08/08	04/08/08	06/11/08	09/08/08	04/08/08	06/11/08	09/08/08	04/08/08	06/11/08	09/08/08
	SACODE	NRWQC					DUPLICATE		DUPLICATE		DUPLICATE									
VOLATILES (UG/L)	BTEX		0.5 U	0.5 U	NA	0.5 U	0.5 U	0.49 J	0.46 J	NA	NA	0.5 U	2.4	NA	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA
	CARBON DISULFIDE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.32 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	CHLOROBENZENE		0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	25	5.7 J	15	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U
	CYCLOHEXANE		0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	2.6	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ
	ISOPROPYLBENZENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.32 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	TOLUENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.49 J	0.46 J	0.5 U	0.5 U	0.5 U	2.4	5.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	TOTAL CHLORINATED VOCS		0.5 UJ	0.5 UJ	NA	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	NA	NA	25 J	5.7 J	NA	0.5 UJ	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA
VPH MADEP (UG/L)	C5-C8 ALIPHATICS		100 U	100 UJ	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	160 J	100 UJ	100 U	100 U	100 U	100 U	100 U	100 UJ	100 U
SEMIVOLATILES (UG/L)	4-METHYLPHENOL		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	22	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	ACENAPHTHENE		0.14	0.12	0.17	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	BENZALDEHYDE		20 UJ	20 UJ	1.8 J	20 UJ	20 UJ	20 UJ	20 UJ	5.1 J	1.8 J	20 UJ	1.8 J	2.2 J	20 UJ	20 UJ	20 U	20 UJ	20 UJ	1.3 J
	BIS(2-ETHYLHEXYL)PHTHALATE		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.5	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U
	CAPROLACTAM		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	FLUORENE		0.1 U	0.1 U	0.1	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	LOW MOLECULAR WEIGHT PAHS		0.14	0.12	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	NA	NA	0.24	0.24	NA	0.1 UJ	0.1 U	NA	0.1 U	0.1 U	NA
	NAPHTHALENE		0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.24	0.24	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	PENTACHLOROPHENOL	15	1 U	0.5 UJ	0.5 U	1 U	1 U	0.5 UJ	0.5 UJ	0.5 UJ	0.64	1 U	0.5 UJ	0.5 U	1 U	0.5 UJ	0.5 U	1 U	0.5 UJ	0.5 U
	PHENOL		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	9.2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
	TOTAL PAHS		0.14	0.12	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	NA	NA	0.24	0.24	NA	0.1 UJ	0.1 UJ	NA	0.1 U	0.1 U	NA
EPH MADEP (UG/L)	C11-C22 AROMATICS		100 U	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 U	170	100 U	100 U	100 U	100 U	100 U	100 U	100 U
	C19-C36 ALIPHATICS		200 UJ	200 UJ	200 U	200 U	200 U	200 UJ	200 UJ	200 U	200 U	200 U	210 J	200 U	200 U	200 UJ	200 U	200 UJ	200 UJ	200 U
PESTICIDES/PCBS (UG/L)	ENDRIN ALDEHYDE		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.15 J	0.02 U	0.02 U	0.02 U
	GAMMA-BHC (LINDANE)		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.029 U	0.014 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
	HEPTACHLOR EPOXIDE	0.0038	0.01 U	0.049	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.049	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U
METALS (UG/L)	ALUMINUM		1710	2480	790	306	202	1110	1120	86.4 J	107	3610	24400	441	52.2 J	100 U	65.2 U	96.5 J	100 U	108
	ARSENIC		0.181 U	1 U	0.311 U	0.559 J	0.329 J	1 U	1 U	0.340 J	0.311 U	2.1	10.2	1.5	0.181 U	1 U	0.311 U	0.181 U	1 U	0.311 U
	BARIUM		231	285	270 J	85.2	65	161	163	60.8 J	60.6 J	132	411	116 J	30.5	72.1	41.8 J	33	97.3	61.2 J
	BERYLLIUM		0.073 U	1 U	0.035 J	0.073 U	0.073 U	1 U	1 U	0.021 U	0.021 U	0.096 J	5 U	0.021 U	0.073 U	1 U	0.025 J	0.073 U	1 U	0.033 J
	CADMIUM		0.072 J	1 U	0.027 UJ	0.052 U	0.052 U	1 U	1 U	0.027 UJ	0.027 UJ	0.098 J	1 U	0.027 UJ	0.052 U	1 U	0.027 UJ	0.052 U	1 U	0.027 UJ
	CALCIUM		227000	217000	221000	64300	63200	69000	68300	53500	51900	52500	67800	54600	10400	14700	9910	10600	16600	12100
	CHROMIUM		1.8 UJ	2.2	1.4 UJ	1.2 UJ	1.1 UJ	2 U	2 U	0.425 UJ	0.557 UJ	4.1 U	23.7	0.865 UJ	1.3 UJ	2 U	0.719 UJ	3.2 U	2 U	0.999 UJ
	COBALT		0.878 J	1 U	0.632 J	2.1	2	3	2.9	1.5	1.5	2.5	7.5	3.4	0.201 J	1.3	0.547 J	0.239 J	1.4	0.896 J
	COPPER		2	3.8 J	1.4	1.5	1.1	2 J	2.3 J	0.641 U	0.672 J	6.7	42.4 J	1.6	1.6	4 J	1.6	1.3	1.1 J	1.7
	CYANIDE		2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.7 J	2.4 U	2.4 U	2.4 U	10.2 J	3.6	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
	IRON		39000 J	31000	27900	41800 J	26000 J	27800	27200	10300	10300	35100 J	82400	85400	256 J	1570	909	220 J	1450	1310
	LEAD		4.3	8.6	2.2	2	1.5	4.3	4.4	0.389 J	0.467 J	30.5	228	3.5	0.45 J	1 U	1.1	0.769 J	1 U	2.4
	MAGNESIUM		16500	16300	15700	8290	8110	8300	8390	7280	7110	6190	9040	5490	2790	3640	2360	3020	4140	2910
	MANGANESE		4710	4290	4220	9070	8430	32100	31800	14700	11800	18500	34400	21900	101	2980	777	113	3890	1140
	NICKEL		5.3	4.4 J	4.1	2.9	2.9	2.5 J	2.8 J	1.5	1.7	3.3	13.5 J	2	1.1	3.7 J	1.6	1.7	2 J	1.8
	POTASSIUM		11400	12800	12100	4310	4130	2000 U	2000 U	2610	2590	2740	11100	2390	2280	2300	2060	2560	2830	2490
	SELENIUM		0.231 U	2 U	0.170 J	0.231 U	0.231 U	2 U	2 U	0.152 U	0.152 U	0.404 J	2 U	0.250 J	0.231 U	2 U	0.152 U	0.231 U	2 U	0.152 U
	SILVER		0.032 U	1 U	0.015 UJ	0.032 U	0.032 U	1 U	1 U	0.013 U	0.013 U	0.044 J	1 U	0.019 UJ	0.032 U	1 U	0.406 J	0.032 U	1 U	0.014 UJ
	SODIUM		24500	24100	22100	7040	6890	6750	6870	6650	6660	8170	9410	7240	41000	47500	28600	51400	62900	43100
	THALLIUM		0.049 U	1 U	0.075 U	0.049 U	0.049 U	1 U	1 U	0.075 U	0.075 U	0.049 U	1 U	0.075 U	0.091 J	1 U	0.075 U	0.049 U	1 U	0.075 U
	VANADIUM		3.3	4.3	1.8	1.3	0.534 J	1.8	1.5	0.910 U	0.910 U	5.2	36.9	0.953 J	0.116 U	1 U	0.910 U	0.116 U	1 U	0.910 U
	ZINC		25.8 U	29.7 J	17.1 J	28.3 U	20.8 U	23.2 J	25.6 J	12.2 J	12.1 J	42.4	243 J	20.2	36.9	22.5 J	20.1	22.2 U	20 UJ	12.2 J

BOLD AND SHADED- AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED;

TABLE 2-10
RDA SURFACE WATER ANALYTICAL RESULTS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
SOUTH WEYMOUTH, MASSACHUSETTS

FRACTION (UNITS)	SAMPLE_ID		RDA-SW-SW01-0408	RDA-SW-SW01-0608	RDA-SW-SW01-0908	RDA-SW-SW02-0408	RDA-SW-SW02-0408-D	RDA-SW-SW02-0608	RDA-SW-SW02-0608-D	RDA-SW-SW02-0908	RDA-SW-SW02-0908-D	RDA-SW-SW03-0408	RDA-SW-SW03-0608	RDA-SW-SW03-0908	RDA-SW-SWD-0408	RDA-SW-SWD-0608	RDA-SW-SWD-0908	RDA-SW-SWU-0408	RDA-SW-SWU-0608	RDA-SW-SWU-0908
	LOCATION_ID		RDA-SW01	RDA-SW01	RDA-SW01	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW02	RDA-SW03	RDA-SW03	RDA-SW03	RDA-SWD	RDA-SWD	RDA-SWD	RDA-SWU	RDA-SWU	RDA-SWU
	SAMPLE_DATE		04/08/08	06/11/08	09/08/08	04/08/08	04/08/08	06/11/08	06/11/08	09/08/08	09/08/08	04/08/08	06/11/08	09/08/08	04/08/08	06/11/08	09/08/08	04/08/08	06/11/08	09/08/08
	SACODE	NRWQC					DUPLICATE		DUPLICATE		DUPLICATE									
DISSOLVED METALS (UG/L)	ALUMINUM	87	29.8 J	100 U	65.2 U	26.2 U	26.2 U	100 U	100 U	65.2 U	65.2 U	26.2 U	[illegible]	65.2 U	74 J	100 U	65.2 U	47.3 J	100 U	65.2 U
	ARSENIC	150	0.181 U	1 U	0.311 U	0.181 U	0.181 U	1 U	1 U	0.311 U	0.311 U	0.181 U	1.3	0.440 J	0.181 U	1 U	0.311 U	0.181 U	1 U	0.311 U
	BARIUM		171	200	238	37.6	42.5	113	112	56.9	52.3	54.4	109	77.7	29.4	60.7	39.3	26.4	85.2	56.7
	BERYLLIUM		0.073 U	1 U	0.021 U	0.073 U	0.073 U	1 U	1 U	0.021 U	0.021 U	0.073 U	1 U	0.021 U	0.073 U	1 U	0.021 U	0.073 U	1 U	0.021 J
	CADMIUM	0.45	0.052 U	1 U	0.027 UJ	0.052 U	0.052 U	1 U	1 U	0.027 UJ	0.027 UJ	0.052 U	1 U	0.027 UJ	0.052 U	1 U	0.027 UJ	0.052 U	[illegible]	0.027 UJ
	CALCIUM		190000	199000	217000	49500	54300	62000	59300	48500	50600	43300	51900	55000	10700	14000	10000	8510	15000	12000
	COBALT		0.398 J	1 U	0.427 J	1.4	1.6	2.2	2.2	1.5	1.4	1.4	2.3	2.8	0.187 J	1	0.499 J	0.182 J	1.2	0.777 J
	COPPER	18.9	0.501 J	1 U	0.641 U	0.467 J	0.478 J	1 U	1 U	0.641 U	0.641 U	0.409 J	1.1	0.641 U	1.4	1 U	1.2	1.1	1 U	1.2
	IRON	1000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	174	358 J	427	78.9 J	394 J	481
	LEAD	6.41	0.123 J	1 U	0.052 UJ	0.041 J	0.224 J	1 U	1 U	0.050 UJ	0.048 UJ	0.166 J	3.2	0.100 UJ	0.284 J	1 U	0.449 J	0.395 J	1 U	0.520 J
	MAGNESIUM		13800	14900	15400	6490	7070	7560	7330	6640	7010	4880	5790	5730	2850	3490	2370	2410	3740	2930
	MANGANESE		3900	3900	4130	6510	7180	27800	28100	13200	11500	13600	26700	18900	101	2710	755	71.3	3420	1050
	NICKEL	109	4.4	3.2	3.9	2.3	2.7	1.7	1.8	1.6	1.5	1.6	2	1.8	1.1	1.5	1.2	2.3	1.9	1.8
	POTASSIUM		9420	11600	11800	3220	3530	2000 U	2000 U	2380	2490	1930 J	7940	2330	2230	2180	2060	2000	2540	2460
	SELENIUM	5	0.231 U	2 U	0.154 J	0.231 U	0.231 U	2 U	2 U	0.152 U	0.152 U	0.231 U	2 U	0.152 U	0.231 U	2 U	0.152 U	0.231 U	2 U	0.152 U
	SODIUM		20400	22500	21700 J	5590	6040	6210	6060	6180 J	6560 J	6750	7490	7640 J	42000	44800	29200 J	41400	56900	41900 J
	ZINC	247	18.3 UJ	20 U	5.7 U	15.1 UJ	15.9 UJ	20 U	20 U	17.8 J	9.7 J	16.1 UJ	20 U	8.5 J	39	21.2	25.6	21.7 U	20 U	25.6
MISCELLANEOUS PARAMETERS (MG/L)	ALKALINITY	20	730	690	720	200	240	280	290	180	200	240	300	220	40 U	55	34	20 U	56	39
	CHEMICAL OXYGEN DEMAND		43	65	59	37	37	58	67	37	40	27	200	67	21 U	31	34	20 U	39	40
	CHLORIDE	230	12	13	13	8.9	8.6	3.6	3.6	12	12	10	15	10	67	80	48	88	110	75
	FERROUS IRON		29.4 J	18.4	23.8	12.4 J	18.9 J	4.85	6.5	5.3 J	2.8 J	21 J	23.6	15.2	0.03 J	0.1	0.2	0.03 UJ	0.27	0.23
	NITRATE-N		0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.27	0.15	0.16	0.28	0.14	0.15
	SULFATE		38	5 U	5 U	7.1	6.5	5 U	5 U	5.2	5.2	22	5.6	7.7	11	5 U	5 U	13	5.3	5 U
	TOTAL DISSOLVED SOLIDS		730	740	770	250	250	320	330	270	270	230	340	250	140	180	180	190	270	230

BOLD AND SHADED- AT LEAST ONE CRITERIA (EXCLUDING BACKGROUND) EXCEEDED; GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED;

TABLE 2-11
RDA SEDIMENT ANALYTICAL SUMMARY STATISTICS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
VOLATILE ORGANIC COMPOUNDS (UG/KG)			
2-BUTANONE	4/4	60-220	2 max samples
ACETONE	4/4	150-440	RDA-SD-SD01-0607-D
CHLOROBENZENE	2/4	4-38	RDA-SD-SD03-0607
CYCLOHEXANE	2/4	140-170	RDA-SD-SD02-0607
ISOPROPYLBENZENE	2/4	1-5	RDA-SD-SD02-0607
METHYL CYCLOHEXANE	1/4	16-16	RDA-SD-SD03-0607
TOLUENE	1/4	1-1	RDA-SD-SD03-0607
VPH (UG/L)			
C5-C8 ALIPHATICS	3/4	45000-64000	RDA-SD-SD01-0607-D
SEMIVOLATILE ORGANIC COMPOUNDS (UG/KG)			
2-METHYLNAPHTHALENE	3/4	3.6-6.2	RDA-SD-SD02-0607
ACENAPHTHENE	3/4	15-200	RDA-SD-SD01-0607
ACENAPHTHYLENE	4/4	5.1-72	RDA-SD-SD02-0607
ANTHRACENE	4/4	5.2-58	RDA-SD-SD01-0607-D
BENZO(A)ANTHRACENE	4/4	41-300	RDA-SD-SD01-0607-D
BENZO(A)PYRENE	4/4	62-300	RDA-SD-SD02-0607
BENZO(B)FLUORANTHENE	4/4	160-670	RDA-SD-SD02-0607
BENZO(G,H,I)PERYLENE	4/4	26-120	RDA-SD-SD02-0607
BENZO(K)FLUORANTHENE	4/4	51-220	RDA-SD-SD02-0607
CARBAZOLE	1/4	34-34	RDA-SD-SD01-0607-D
CHRYSENE	4/4	55-330	RDA-SD-SD02-0607
DIBENZO(A,H)ANTHRACENE	4/4	12-21	RDA-SD-SD02-0607
DIBENZOFURAN	1/4	36-36	RDA-SD-SD01-0607
FLUORANTHENE	4/4	36-790	RDA-SD-SD01-0607-D
FLUORENE	4/4	3.4-200	RDA-SD-SD01-0607
INDENO(1,2,3-CD)PYRENE	4/4	22-100	RDA-SD-SD02-0607
NAPHTHALENE	3/4	8.7-16	RDA-SD-SD01-0607-D
PHENANTHRENE	4/4	23-210	RDA-SD-SD02-0607
PYRENE	4/4	24-460	RDA-SD-SD01-0607-D
EPH (UG/KG)			
C11-C22 AROMATICS	3/4	60000-77000	RDA-SD-SD01-0607-D
C19-C36 ALIPHATICS	4/4	47000-140000	RDA-SD-SD02-0607
PESTICIDES/PCBs (UG/KG)			
4,4'-DDD	3/4	28-46	RDA-SD-SD02-0607
4,4'-DDE	4/4	3.2-19	RDA-SD-SD01-0607-D
4,4'-DDT	2/4	3.6-4.8	RDA-SD-SD01-0607-D
ALPHA-CHLORDANE	3/4	4.6-8	RDA-SD-SD01-0607
AROCLOR-1242	1/4	48-48	RDA-SD-SD01-0607-D
AROCLOR-1260	3/4	24-51	RDA-SD-SD01-0607-D
ENDRIN	1/4	5.5-5.5	RDA-SD-SD01-0607-D
ENDRIN ALDEHYDE	1/4	4.3-4.3	RDA-SD-SD01-0607
ENDRIN KETONE	1/4	3.7-3.7	RDA-SD-SD02-0607
GAMMA-CHLORDANE	3/4	3.4-5.6	RDA-SD-SD01-0607-D
TOTAL METALS (MG/KG)			
ALUMINUM	4/4	6800-58200	RDA-SD-SD01-0607-D
ARSENIC	4/4	3.5-33.3	RDA-SD-SD01-0607-D
BARIUM	4/4	84-480	RDA-SD-SD02-0607
BERYLLIUM	1/4	1.1-1.1	RDA-SD-SD02-0607
CADMIUM	4/4	0.5-7.4	RDA-SD-SD01-0607-D
CALCIUM	4/4	4930-50600	RDA-SD-SD01-0607-D
CHROMIUM	4/4	10.2-71.4	RDA-SD-SD01-0607-D

TABLE 2-11
RDA SEDIMENT ANALYTICAL SUMMARY STATISTICS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
COBALT	4/4	4.5-32.6	RDA-SD-SD01-0607-D
COPPER	4/4	44.7-156	RDA-SD-SD01-0607-D
IRON	4/4	8570-22000	RDA-SD-SD01-0607
LEAD	4/4	61.6-107	RDA-SD-SD02-0607
MAGNESIUM	4/4	1390-14300	RDA-SD-SD01-0607-D
MANGANESE	4/4	421-2160	RDA-SD-SD03-0607
NICKEL	4/4	7.2-52.1	RDA-SD-SD01-0607-D
POTASSIUM	4/4	240-1090	RDA-SD-SD01-0607
SELENIUM	2/4	0.22-0.31	RDA-SD-SD01-0607-D
SILVER	2/4	4.2-19	RDA-SD-SD01-0607-D
SODIUM	4/4	32.5-209	RDA-SD-SD01-0607
VANADIUM	4/4	15.7-259	RDA-SD-SD01-0607-D
ZINC	4/4	76.8-994	RDA-SD-SD01-0607-D

TABLE 2-12
RDA SEDIMENT ANALYTICAL SUMMARY STATISTICS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
PAGE 1 OF 2

Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
VOLATILE ORGANIC COMPOUNDS (UG/L)			
2-BUTANONE	2/4	28-490	RDA-SD-SD02-0608
ACETONE	4/4	48-1600	RDA-SD-SD02-0608
BTEX	4/4	1.9-11	RDA-SD-SD02-0608
CHLOROBENZENE	3/4	4.5-35	RDA-SD-SD03-0608
ISOPROPYLBENZENE	3/4	1.1-17	RDA-SD-SD02-0608
METHYL CYCLOHEXANE	3/4	3.8-28	RDA-SD-SD02-0608
TOLUENE	1/4	1.9-1.9	RDA-SD-SD03-0608
TOTAL CHLORINATED VOCS	3/4	4.5-35	RDA-SD-SD03-0608
TOTAL XYLENES	3/4	2.3-11	RDA-SD-SD02-0608
VPH (UG/L)			
C5-C8 ALIPHATICS	2/4	250000-530000	RDA-SD-SD02-0608
SEMIVOLATILE ORGANIC COMPOUNDS (UG/L)			
2-METHYLNAPHTHALENE	2/4	8.4-24	RDA-SD-SD02-0608
2-METHYLPHENOL	3/4	12-17	RDA-SD-SD02-0608-D
4-METHYLPHENOL	1/4	120-120	RDA-SD-SD02-0608
ACENAPHTHENE	4/4	4-36	RDA-SD-SD02-0608
ACENAPHTHYLENE	3/4	18-100	RDA-SD-SD02-0608
ANTHRACENE	4/4	6.7-160	RDA-SD-SD02-0608
BENZALDEHYDE	4/4	340-1200	RDA-SD-SD02-0608-D
BENZO(A)ANTHRACENE	4/4	37-240	RDA-SD-SD02-0608
BENZO(A)PYRENE	4/4	37-270	RDA-SD-SD02-0608
BENZO(B)FLUORANTHENE	4/4	83-400	RDA-SD-SD02-0608
BENZO(G,H,I)PERYLENE	4/4	29-210	RDA-SD-SD02-0608
BENZO(K)FLUORANTHENE	4/4	27-210	RDA-SD-SD02-0608
BIS(2-CHLORETHYL)ETHER	1/4	25-25	RDA-SD-SD02-0608-D
BIS(2-ETHYLHEXYL)PHTHALATE	3/4	150-550	RDA-SD-SD02-0608-D
BUTYL BENZYL PHTHALATE	2/4	370-460	RDA-SD-SD02-0608-D
CHRYSENE	4/4	53-390	RDA-SD-SD02-0608
DI-N-BUTYL PHTHALATE	1/4	160-160	RDA-SD-SD01-0608
DIBENZO(A,H)ANTHRACENE	4/4	10-86	RDA-SD-SD02-0608
FLUORANTHENE	4/4	68-920	RDA-SD-SD02-0608
FLUORENE	4/4	6.1-52	RDA-SD-SD02-0608
HIGH MOLECULAR WEIGHT PAHS	4/4	440-3606	RDA-SD-SD02-0608
INDENO(1,2,3-CD)PYRENE	4/4	29-200	RDA-SD-SD02-0608
LOW MOLECULAR WEIGHT PAHS	4/4	47.7-893	RDA-SD-SD02-0608
NAPHTHALENE	4/4	7.9-41	RDA-SD-SD02-0608
PHENANTHRENE	4/4	23-480	RDA-SD-SD02-0608
PHENOL	4/4	31-47	RDA-SD-SD01-0608
PYRENE	4/4	60-680	RDA-SD-SD02-0608
TOTAL PAHS	4/4	487.7-449	RDA-SD-SD02-0608
EPH (UG/L)			
C11-C22 AROMATICS	3/4	81000-220000	RDA-SD-SD02-0608-D
C19-C36 ALIPHATICS	3/4	98000-230000	RDA-SD-SD02-0608-D
PESTICIDES/PCBs			
4,4'-DDD	3/4	34 - 110	RDA-SD-SD02-0608
4,4'-DDE	2/4	3.7 - 33	RDA-SD-SD02-0608
ALPHA-CHLORDANE	1/4	5.1 - 5.1	RDA-SD-SD03-0608
DELTA-BHC	1/4	0.85 - 0.85	RDA-SD-SD03-0608
ENDOSULFAN SULFATE	1/4	9.8 - 9.8	RDA-SD-SD02-0608-D
GAMMA-CHLORDANE	1/4	3.6 - 3.6	RDA-SD-SD03-0608
TOTAL DDD/DDE/DDT	4/4	3.7 - 143	RDA-SD-SD02-0608

TABLE 2-12
RDA SEDIMENT ANALYTICAL SUMMARY STATISTICS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
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Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
TOTAL METALS (UG/L)			
ALUMINUM	4/4	5290-16800	RDA-SD-SD02-0608-D
ANTIMONY	3/4	0.49-0.56	2 max samples
ARSENIC	4/4	3-10.1	RDA-SD-SD01-0608
BARIUM	4/4	46.2-155	RDA-SD-SD02-0608-D
BERYLLIUM	4/4	0.28-1.6	RDA-SD-SD02-0608
CADMIUM	4/4	0.17-2.5	RDA-SD-SD01-0608
CALCIUM	4/4	1980-10900	RDA-SD-SD02-0608
CHROMIUM	4/4	6.8-21.4	RDA-SD-SD01-0608
COBALT	4/4	2.5-6.8	RDA-SD-SD02-0608-D
COPPER	4/4	11.2-44.2	RDA-SD-SD02-0608-D
CYANIDE	1/4	0.18-0.18	RDA-SD-SD02-0608
IRON	4/4	9170-74700	RDA-SD-SD01-0608
LEAD	4/4	35.8-165	RDA-SD-SD02-0608-D
MAGNESIUM	4/4	1440-3780	RDA-SD-SD01-0608
MANGANESE	4/4	455-2610	RDA-SD-SD02-0608
MERCURY	4/4	0.015-0.28	RDA-SD-SD02-0608-D
NICKEL	4/4	4.5-13.7	RDA-SD-SD02-0608-D
POTASSIUM	4/4	258-1140	RDA-SD-SD01-0608
SELENIUM	4/4	1.2-4.8	RDA-SD-SD02-0608
SODIUM	4/4	43.5-217	RDA-SD-SD01-0608
THALLIUM	1/4	0.42-0.42	RDA-SD-SD02-0608-D
VANADIUM	4/4	13-48.5	RDA-SD-SD02-0608-D
ZINC	4/4	47.1-244	RDA-SD-SD02-0608-D

TABLE 2-13
RDA SEDIMENT ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS
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FRACTION (UNITS)	SAMPLE_ID	RDA-SD-SD01-0607	RDA-SD-SD01-0607-D	RDA-SD-SD02-0607	RDA-SD-SD03-0607
	LOCATION_ID	RDA-SD01	RDA-SD01	RDA-SD02	RDA-SD03
	SAMPLE_DATE	06/14/07	06/14/07	06/14/07	06/15/07
	SACODE		DUPLICATE		
VOLATILES (UG/KG)	2-BUTANONE	150	220	220	60
	ACETONE	280 J	440 J	380 J	150 J
	CHLOROBENZENE	17 U	24 U	4 J	38
	CYCLOHEXANE	17 U	24 U	170	140
	ISOPROPYLBENZENE	17 U	24 U	5 J	1 J
	METHYL CYCLOHEXANE	17 U	24 U	19 U	16
	TOLUENE	17 U	24 U	19 U	1 J
VPH MADEP (UG/KG)	C5-C8 ALIPHATICS	45000 J	64000 J	63000	15000 U
SEMIVOLATILES (UG/KG)	2-METHYLNAPHTHALENE	3.6 J	4.9 J	6.2 J	3.2 U
	ACENAPHTHENE	200 J	190 J	15 J	3.2 U
	ACENAPHTHYLENE	22 J	28 J	72 J	5.1 J
	ANTHRACENE	44 J	58 J	50 J	5.2 J
	BENZO(A)ANTHRACENE	180 J	300 J	230 J	41 J
	BENZO(A)PYRENE	160 J	180 J	300 J	62 J
	BENZO(B)FLUORANTHENE	300 J	570 J	670 J	160 J
	BENZO(G,H,I)PERYLENE	34 J	60 J	120 J	26 J
	BENZO(K)FLUORANTHENE	150 J	130 J	220 J	51 J
	CARBAZOLE	330 U	34 J	330 U	320 U
	CHRYSENE	210 J	180 J	330 J	55 J
	DIBENZO(A,H)ANTHRACENE	14 J	18 J	21 J	12
	DIBENZOFURAN	36 J	320 U	330 U	320 U
	FLUORANTHENE	430	790	450	36 J
	FLUORENE	200 J	180 J	20 J	3.4 J
	INDENO(1,2,3-CD)PYRENE	38 J	62 J	100 J	22 J
	NAPHTHALENE	10 J	16 J	8.7 J	3.2 U
	PHENANTHRENE	95 J	120 J	210 J	23 J
	PYRENE	220 J	460	330	24
	HIGH MOLECULAR WEIGHT PAHS	1736 J	2750 J	2771 J	489 J
	LOW MOLECULAR WEIGHT PAHS	574.6 J	596.9 J	381.9 J	36.7 J
	TOTAL PAHS	2310.6 J	3346.9 J	3152.9 J	525.7 J
EPH MADEP (UG/KG)	C11-C22 AROMATICS	62000	77000	60000	40000 U
	C19-C36 ALIPHATICS	110000	130000	140000	47000
PESTICIDES/PCBS (UG/KG)	4,4'-DDD	28	40	46	1.6 U
	4,4'-DDE	15	19	18	3.2
	4,4'-DDT	3.6 J	4.8 J	3.3 U	1.6 U
	TOTAL DDD/DDE/DDT	46.6 J	63.8 J	64	3.2
	ALPHA-CHLORDANE	8 J	7.3 J	1.7 U	4.6 J
	ENDRIN	3.3 U	5.5 J	3.3 U	1.6 UJ
	ENDRIN ALDEHYDE	4.3	3.2 U	3.3 U	1.6 UJ
	ENDRIN KETONE	3.3 U	3.2 U	3.7 J	1.6 U
	GAMMA-CHLORDANE	5.2 J	5.6 J	1.7 U	3.4 J
	AROCLOR-1242	16 UJ	48 J	16 U	16 U
	AROCLOR-1260	40 J	51 J	24 J	16 UJ
	TOTAL AROCLOR	40 J	99 J	24 J	16 UJ

GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-13
RDA SEDIMENT ANALYTICAL RESULTS - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS
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FRACTION (UNITS)	SAMPLE_ID	RDA-SD-SD01-0607	RDA-SD-SD01-0607-D	RDA-SD-SD02-0607	RDA-SD-SD03-0607
	LOCATION_ID	RDA-SD01	RDA-SD01	RDA-SD02	RDA-SD03
	SAMPLE_DATE	06/14/07	06/14/07	06/14/07	06/15/07
	SACODE		DUPLICATE		
METALS (MG/KG)	ALUMINUM	10100 J	58200 J	46400 J	6800 J
	ARSENIC	6.2 J	33.3 J	19.2 J	3.5 J
	BARIUM	84 J	382 J	480 J	87.4 J
	BERYLLIUM	0.02 U	0.028 U	1.1 J	0.0076 U
	CADMIUM	2 J	7.4 J	5.3 J	0.5 J
	CALCIUM	10800 J	50600 J	33200 J	4930 J
	CHROMIUM	13.9 J	71.4 J	47.2 J	10.2 J
	COBALT	7.1 J	32.6 J	28.5 J	4.5 J
	COPPER	55.6 J	156 J	132 J	44.7 J
	IRON	22000 J	21400 J	8570 J	18800 J
	LEAD	97.6 J	83.1 J	107 J	61.6 J
	MAGNESIUM	3020 J	14300 J	5800 J	1390 J
	MANGANESE	421 J	1820 J	1470 J	2160 J
	NICKEL	10.7 J	52.1 J	40.8 J	7.2 J
	POTASSIUM	1090	988	240	255
	SELENIUM	0.22 J	0.31 J	0.36 UJ	0.083 UJ
	SILVER	4.5 UJ	19 J	8.3 UJ	4.2 J
	SODIUM	209	184 J	77.7 J	32.5 J
	VANADIUM	56.7 J	259 J	104 J	15.7 J
	ZINC	261 J	994 J	660 J	76.8 J

GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-14
RDA SEDIMENT ANALYTICAL RESULTS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS
PAGE 1 OF 2

FRACTION (UNITS)	SAMPLE_ID	RDA-SD-SD01-0608	RDA-SD-SD02-0608	RDA-SD-SD02-0608-D	RDA-SD-SD03-0608
	LOCATION_ID	RDA-SD01	RDA-SD02	RDA-SD02	RDA-SD03
	TOP_DEPTH	0	0	0	0
	BOTTOM_DEPTH	0.5	0.5	0.5	0.5
	SAMPLE_DATE	06/10/08	06/10/08	06/10/08	06/10/08
	SACODE			DUPLICATE	
	QC_TYPE			FD	
VOLATILES (UG/KG)	2-BUTANONE	28 J	490 J	13 UJ	2.7 UJ
	ACETONE	150 J	1600 J	1400 J	48 J
	BTEX	2.3 J	11 J	9 J	1.9 J
	CHLOROBENZENE	7.1 U	7.6 J	4.5 J	35 J
	ISOPROPYLBENZENE	7.1 U	17 J	14 J	1.1 J
	METHYL CYCLOHEXANE	7.1 U	28 J	27 J	3.8 J
	TOLUENE	7.1 U	17 U	13 U	1.9 J
	TOTAL CHLORINATED VOCS	7.1 UJ	7.6 J	4.5 J	35 J
	TOTAL XYLENES	2.3 J	11 J	9 J	2.7 UJ
VPH MADEP (UG/KG)	C5-C8 ALIPHATICS	250000 J	63000 UJ	530000 J	110000 U
SEMIVOLATILES (UG/KG)	2-METHYLNAPHTHALENE	3.2 U	24 J	8.4 J	3.2 U
	2-METHYLPHENOL	12	15	17	3.2 U
	4-METHYLPHENOL	320 U	120 J	320 U	320 U
	ACENAPHTHENE	30	36 J	12 J	4
	ACENAPHTHYLENE	18	100 J	38 J	3.2 U
	ANTHRACENE	38	160 J	53 J	6.7
	BENZALDEHYDE	580 J	1000 J	1200 J	340 J
	BENZO(A)ANTHRACENE	94	240 J	76 J	37
	BENZO(A)PYRENE	55	270 J	75 J	37
	BENZO(B)FLUORANTHENE	83	400 J	110 J	89 J
	BENZO(G,H,I)PERYLENE	31	210 J	29 J	30
	BENZO(K)FLUORANTHENE	45	210 J	98 J	27 J
	BIS(2-CHLOROETHYL)ETHER	3.2 U	6.6 UJ	25 J	3.2 UJ
	BIS(2-ETHYLHEXYL)PHTHALATE	270 J	150 J	550	320 U
	BUTYL BENZYL PHTHALATE	320 U	370	460	320 U
	CHRYSENE	110	390 J	100 J	53
	DIBENZO(A,H)ANTHRACENE	12	86 J	27 J	10
	DI-N-BUTYL PHTHALATE	160 J	330 U	320 U	320 U
	FLUORANTHENE	450	920 J	300 J	68
	FLUORENE	29	52 J	15 J	6.1
	HIGH MOLECULAR WEIGHT PAHS	1281	3606 J	1149 J	440 J
	INDENO(1,2,3-CD)PYRENE	31	200 J	64 J	29
	LOW MOLECULAR WEIGHT PAHS	190.6	893 J	274.4 J	47.7
	NAPHTHALENE	9.6	41 J	18 J	7.9
	PHENANTHRENE	66	480 J	130 J	23
	PHENOL	47 J	32 J	34 J	31 J
	PYRENE	370	680 J	270 J	60
	TOTAL PAHS	1471.6	4499 J	1423.4 J	487.7 J
EPH MADEP (UG/KG)	C11-C22 AROMATICS	81000	100000 J	220000 J	49000 U
	C19-C36 ALIPHATICS	98000	150000	230000	49000 U
PESTICIDES/PCBS (UG/KG)	4,4'-DDD	37	110 J	34 J	1.6 U
	4,4'-DDE	8 U	33 J	8.1 U	3.7 J
	ALPHA-CHLORDANE	4.1 U	8.5 U	4.2 U	5.1 J
	DELTA-BHC	4.1 U	8.5 U	4.2 U	0.85 J
	ENDOSULFAN SULFATE	8 U	17 U	9.8 J	10 U
	GAMMA-CHLORDANE	4.1 U	8.5 U	4.2 U	3.6 J
	TOTAL DDD/DDE/DDT	37	143 J	34 J	3.7 J

TABLE 2-14
RDA SEDIMENT ANALYTICAL RESULTS - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS
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FRACTION (UNITS)	SAMPLE_ID	RDA-SD-SD01-0608	RDA-SD-SD02-0608	RDA-SD-SD02-0608-D	RDA-SD-SD03-0608
	LOCATION_ID	RDA-SD01	RDA-SD02	RDA-SD02	RDA-SD03
	TOP_DEPTH	0	0	0	0
	BOTTOM_DEPTH	0.5	0.5	0.5	0.5
	SAMPLE_DATE	06/10/08	06/10/08	06/10/08	06/10/08
	SACODE			DUPLICATE	
	QC_TYPE			FD	
METALS (MG/KG)	ALUMINUM	13200	14300	16800	5290
	ANTIMONY	0.56 J	0.56 J	0.49 J	0.13 UJ
	ARSENIC	10.1	6.3	7.7	3
	BARIUM	95.5	150	155	46.2
	BERYLLIUM	0.74	1.6	1.4	0.28
	CADMIUM	2.5 J	1.9	2.2	0.17 J
	CALCIUM	10500	10900	8690	1980
	CHROMIUM	21.4	13.3	13.8	6.8
	COBALT	6.7	6	6.8	2.5
	COPPER	37	41.7	44.2	11.2
	CYANIDE	0.12 U	0.18 J	0.13 U	0.12 U
	IRON	74700	17800	14000	9170
	LEAD	65	123	165	35.8
	MAGNESIUM	3780	1920	2160	1440
	MANGANESE	561	2610	1680	455
	MERCURY	0.067	0.26	0.28	0.015 J
	NICKEL	11.7 J	11.9	13.7	4.5 J
	POTASSIUM	1140	419	404	258
	SELENIUM	2.4	4.8	4.4	1.2 J
	SODIUM	217	117	124	43.5 J
	THALLIUM	0.29 U	0.46 U	0.42 J	0.33 U
	VANADIUM	43.4	38.6	48.5	13
	ZINC	194	215	244	47.1

GREY SHADING - DETECTED; U - NOT DETECTED; UJ - DETECTION LIMIT APPROXIMATE;
J - QUANTITATION LIMIT APPROXIMATE; R - REJECTED

TABLE 2-15
RDA LANDFILL GAS MONITORING RESULTS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MA
PAGE 1 OF 3

Location	LTM Round	Sample Date	Lower Explosive Limit (%)[1]	Methane (%)[2]	Oxygen (%)
GAS VENTS					
GV-01	1	3/28/07	0	0	21.6
	2	6/11/07	1	0.1	21.9
	3	9/17/07	0	0	19.9
	4	12/4/07	>100	7.2	2.5
	5	4/7/08	0	0	21.2
	6	6/14/08	12	0.6	20.1
	7	9/15/08	0	0	0.5
	8	12/15/08	7	0.3	6.3
GV-02	1	3/28/07	0	0	19.4
	2	6/11/07	0	0	8.2
	3	9/17/07	0	0	21.2
	4	12/4/07	16	0.8	20.6
	5	4/7/08	0	0	21.2
	6	6/14/08	0	0	8.3
	7	9/15/08	0	0	22.2
	8	12/15/08	0	0	20.2
GV-03	1	3/28/07	0	0	21.5
	2	6/11/07	0	0	11.7
	3	9/17/07	0	0	18.3
	4	12/4/07	14	0.7	20.7
	5	4/7/08	0	0	16.0
	6	6/14/08	1	0.1	16.0
	7	9/15/08	0	0	22.4
	8	12/15/08	0	0	19.1
GV-04	1	3/28/07	44	2.2	14.1
	2	6/11/07	>100	6	12.7
	3	9/17/07	9	0.5	14.1
	4	12/4/07	NR	NR	NR
	5	4/7/08	2	0.1	17.6
	6	6/14/08	10	0.5	20.2
	7	9/15/08	>100	9.7	1.1
	8	12/15/08	>100	5.1	16.4
GV-05	1	3/28/07	0	0	21.8
	2	6/11/07	0	0	10.3
	3	9/17/07	0	0	20.9
	4	12/4/07	0	0	21.5
	5	4/7/08	0	0	20.0
	6	6/14/08	0	0	13.6
	7	9/15/08	0	0	21.6
	8	12/15/08	0	0	20.5
GV-06	1	3/28/07	200	10.1	10.4
	2	6/11/07	>100	13.6	8.9
	3	9/17/07	>100	21.4	9.3
	4	12/4/07	>100	9.6	15.8
	5	4/7/08	11	0.6	21.3
	6	6/14/08	8	0.4	20.2
	7	9/15/08	>100	5.2	17.2
	8	12/15/08	>100	19	13.1

TABLE 2-15
RDA LANDFILL GAS MONITORING RESULTS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MA
PAGE 2 OF 3

Location	LTM Round	Sample Date	Lower Explosive Limit (%)[1]	Methane (%)[2]	Oxygen (%)
GV-07	1	3/28/07	8	0.4	15.3
	2	6/11/07	2	0.1	16.0
	3	9/17/07	0	0	12.5
	4	12/4/07	41	2.1	16.7
	5	4/7/08	0.0	0	18.5
	6	6/14/08	0.0	0	17.6
	7	9/15/08	0	0	17.5
	8	12/15/08	10	0.4	13.6
GV-08	1	3/28/07	0	0	17.6
	2	6/11/07	0	0	16.3
	3	9/17/07	0	0	17.1
	4	12/4/07	0	0	20.2
	5	4/7/08	0	0	19.6
	6	6/14/08	1	0.1	20.7
	7	9/15/08	0	0	21.8
	8	12/15/08	1	0	19.5
GAS PROBES					
GP-01	1	3/28/07	>1000 (offscale)	72.2	0.0
	2	6/11/07	>100	29.7	3.0
	3	9/17/07	>100	57	0.0
	4	12/4/07	>100	63.5	0.0
	5	4/7/08	>100	42.4	0.6
	6	6/14/08	>100	34	0.9
	7	9/15/08	>100	58.7	0.0
	8	12/15/08	>100	72.7	0.6
GP-02	1	3/28/07	>1000 (offscale)	52.2	0.0
	2	6/11/07	>100	26.5	0.8
	3	9/17/07	>100	54.2	0.0
	4	12/4/07	>100	58.7	0.1
	5	4/7/08	>100	22.5	1.1
	6	6/14/08	>100	37.9	0.4
	7	9/15/08	>100	31.9	5.4
	8	12/15/08	>100	57.1	0.4
GP-03	1	3/28/07	0	0	12.7
	2	6/11/07	2	0.1	19.7
	3	9/17/07	0	0	10.2
	4	12/4/07	17	0.9	1.3
	5	4/7/08	0	0	9.3
	6	6/14/08	1	0.1	16.3
	7	9/15/08	0	0	13.3
	8	12/15/08	2	0.1	3.1
GP-04	1	3/28/07	222	11.4	2.6
	2	6/11/07	0	0	21.6
	3	9/17/07	0	0	14.8
	4	12/4/07	>100	11.7	0.0
	5	4/7/08	0	0	16.2
	6	6/14/08	1	0.1	17.7
	7	9/15/08	>100	5.1	4.6
	8	12/15/08	>100	14.7	0.5
GP-05	1	3/28/07	194	9.5	4.3
	2	6/11/07	24	1.4	17.8
	3	9/17/07	>100	13.2	0.7
	4	12/4/07	NR	NR	NR
	5	4/7/08	86	4.3	1.5
	6	6/14/08	39	2.4	14.4
	7	9/15/08	0	0	17.8
	8	12/15/08	1	0.1	10.8

TABLE 2-15
RDA LANDFILL GAS MONITORING RESULTS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MA
PAGE 3 OF 3

Location	LTM Round	Sample Date	Lower Explosive Limit (%)[1]	Methane (%)[2]	Oxygen (%)
GP-06	1	3/28/07	0	0	0.2
	2	6/11/07	70	3.5	0.0
	3	9/17/07	>100	29.5	0.0
	4	12/4/07	>100	20.2	0.0
	5	4/7/08	37	1.9	1.5
	6	6/14/08	32	1.7	1.0
	7	9/15/08	>100	40.4	0.5
	8	12/15/08	>100	15.8	5.6
GP-07	1	3/28/07	0	0	18.8
	2	6/11/07	1	0.1	20.0
	3	9/17/07	0	0	15.6
	4	12/4/07	19	1	9.1
	5	4/7/08	0	0	18.6
	6	6/14/08	1	0.1	18.6
	7	9/15/08	0	0	18.6
	8	12/15/08	0	0	18.6

Notes:

1) The LEL and the Upper Explosive Limit (UEL) are measures of the percent of gas in the air by volume. At concentrations below the LEL and above the UEL, a gas is not considered explosive. The explosive limits of methane are 5 percent to 15 percent by volume in air, under normal atmospheric conditions.
2) 5% methane is approximately equivalent to 100% Lower Explosion Limit (LEL)
NR - no reading
% - percent
When monitoring was conducted with an FID, the VOCs detected were presumed to be methane because this instrument (unlike the PID) is calibrated with, and responds effectively, to methane.

TABLE 2-16
RDA SMALL MAMMAL TISSUE SAMPLE SUMMARY STATISTICS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS

Chemical	Frequency of Detection	Detection Range	Sample of Maximum Concentration
MISCELLANEOUS PARAMETERS (MG/L)			
LIPIDS	3/3	0.34-3.2	RDA-ET-ET02-091208
PCB HOMOLOG			
DICHLOROBIPHENYLS	2/3	0.64-0.65	RDA-ET-ET02-091208
HEPTACHLOROBIPHENYLS	1/3	86-86	RDA-ET-ET02-091208
HEXACHLOROBIPHENYLS	1/3	230-230	RDA-ET-ET02-091208
OCTACHLOROBIPHENYLS	1/3	1.1-1.1	RDA-ET-ET02-091208
TOTAL AROCLOR	2/3	0.64-320	RDA-ET-ET02-091208

TABLE 2-17
RDA SMALL MAMMAL TISSUE ANALYTICAL RESULTS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS
PAGE 1 OF 1

	SAMPLE_ID	RDA-ET-ET01-091108	RDA-ET-ET02-091208	RDA-ET-ET03-092108
	LOCATION_ID	RDA-ET-ET01	RDA-ET-ET02	RDA-ET-ET03
	TOP_DEPTH			
	BOTTOM_DEPTH			
	SAMPLE_DATE	09/11/08	09/12/08	09/21/08
FRACTION	SACODE			
(UNITS)	QC_TYPE			
PCB HOMOLOGS (UG/KG)	DICHLOROBIPHENYL	0.41 U	0.65	0.64
	HEPTACHLOROBIPHENYL	1.2 U	86	1.2 U
	HEXACHLOROBIPHENYL	0.82 U	230	0.82 U
	OCTACHLOROBIPHENYL	1.2 U	1.1 J	1.2 U
	TOTAL AROCLOR	0.41 U	320	0.64
MISCELLANEOUS PARAMETERS (%)	LIPIDS	2.1	3.2	0.34

TABLE 2-18
RDA GROUNDWATER LONG TERM MONITORING RESULTS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS

		Long-Term Monitoring Sample Date (µg/L)							
Compound/ Element	RG	March 2007	June 2007	Sept. 2007	December 2007	April 2008	June 2008	Sept. 2008	December 2008
Monitoring Well TT-01									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 U	NA	NA	0.1 U	NA	NA	DV pending
Total Arsenic	10	0.8 U	1.6 J	NA	NA	2.5 U	5.3 U	5.3 U	DV pending
Total Manganese	313	163	276	NA	NA	**3090**	**1410**	**421**	DV pending
Total Aroclor	0.5	0.2 U	0.2 U	NA	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well TT-02									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending
Total Arsenic	10	0.8 U	1.6 UJ	2.5 U	**45.7**	2.5U	5.3 U	5.3 U	DV pending
Total Manganese	313	**2080**	**4430**	**4900**	**4890**	**5430**	**4910**	**4210**	DV pending
Total Aroclor	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well TT-03									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending
Total Arsenic	10	**23**	1.7 J	**34.2**	2.5 U	2.5 U	5.3 U	8.4 J	DV pending
Total Manganese	313	**9840**	**9670**	**10600**	**12100**	**11100**	**10700**	**10700**	DV pending
Total Aroclor	0.5	0.2U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well TT-04									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending
Total Arsenic	10	0.8 U	1.6 UJ	7 UJ	3.7 UJ	2.7 J	5.3 U	5.3 U	DV pending
Total Manganese	313	**21800**	**21400**	**18650**	**23000**	**23300**	**19700**	**16700**	DV pending
Total Aroclor	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well TT-05									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending
Total Arsenic	10	0.8 U	1.6 UJ	**30.9**	2.7 U	2.5 U	5.3 U	5.3 U	DV pending
Total Manganese	313	**2490**	**10400**	**10800**	**12900**	**11350**	**10900**	**11000**	DV pending
Total Aroclor	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well TT-06									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending

TABLE 2-18
RDA GROUNDWATER LONG TERM MONITORING RESULTS
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS
PAGE 2 OF 2

Long-Term Monitoring Sample Date (µg/L)									
Compound/ Element	**RG**	**March 2007**	**June 2007**	**Sept. 2007**	**December 2007**	**April 2008**	**June 2008**	**Sept. 2008**	**December 2008**
Total Arsenic	10	0.8 U	1.6 UJ	2.5 U	2.5 U	2.5 U	5.3 U	5.3 U	DV pending
Total Manganese	313	149	101 U	**321**	**383**	248	93.5	283	DV pending
Total Aroclor	0.5	**1.2**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	DV pending
Monitoring Well TT-07									
Benzo(a)pyrene	0.2	0.42 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending
Total Arsenic	10	31.1	4.1 J	**45.7**	2.5 U	4.3 J	5.3 U	5.3 U	DV pending
Total Manganese	313	**11200**	**11700**	**12000**	**11800**	**10900**	**11300**	**11500**	DV pending
Total Aroclor	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well MW-05									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 U	NA	0.1 U	0.1 U	0.1 U	NA	DV pending
Total Arsenic	10	5.7 U	7 J	11.7 U	2.5 U	2.5 U	5.3 U	5.3 U	DV pending
Total Manganese	313	**2910**	**8050**	**2590**	**2190**	**2780**	**3420**	**2990**	DV pending
Total Aroclor	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well MW-50D									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending
Total Arsenic	10	28.3	3.3 J	**31.6**	6.1 UJ	5.1 J	5.3 U	8 J	DV pending
Total Manganese	313	**10900**	**10650**	**11500**	**11500**	**10800**	**10600**	**10600**	DV pending
Total Aroclor	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending
Monitoring Well MW-50D2									
Benzo(a)pyrene	0.2	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	DV pending
Total Arsenic	10	24.6	4.6 J	**32.1**	7 UJ	4.1 J	6.1 J	8.5 J	DV pending
Total Manganese	313	**10600**	**8420**	**10800**	**10800**	**10100**	**10200**	**10200**	DV pending
Total Aroclor	0.5	0.31	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	DV pending

Notes:
Bold indicates RG or MCL/MMCL exceedance
Duplicate samples averaged
The criteria for PCBs is the MCL/MMCL
RG Remedial Goal
NA Not Analyzed
ND Not Detected
U Not Detected
UJ Detection Limit Approximate
J Quantitation Limit Approximate

TABLE 2-19
RDA SUMMARY OF LANDFILLGAS MONITORING - 2007
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS

Sample Date	3/28/2007				6/11/2007				9/17/2007				12/4/2007			
Location	Lower Explosive Limit (%)	Methane (%)	Oxygen (%)	VOCs (ppm) (FID)	Lower Explosive Limit (%)	Methane (%)	Oxygen (%)	VOCs (ppm) (FID)	Lower Explosive Limit (%)	Methane (%)	Oxygen (%)	VOCs (ppm) (FID)	Lower Explosive Limit (%)	Methane (%)	Oxygen (%)	VOCs (ppm) (FID)
RDA-GV-01	0	0	21.6	0	1	0.1	21.9	8	0	0	19.9	37.9	>100	7.2	2.5	651
RDA-GV-02	0	0	19.4	0	0	0	8.2	0	0	0	21.2	7.1	16	0.8	20.6	14.1
RDA-GV-03	0	0	21.5	0	0	0	11.7	0	0	0	18.3	3	14	0.7	20.7	157.3
RDA-GV-04[1]	44	2.2	14.1	4248 (offscale)	>100	6	12.7	4493	9	0.5	14.1	13.5	NR	NR	NR	163.6
RDA-GV-05	0	0	21.8	0	0	0	10.3	0	0	0	20.9	0	0	0	21.5	1165
RDA-GV-06[1]	200	10.1	10.4	4248 (offscale)	>100	13.6	8.9	3133	>100	21.4	9.3	>4223	>100	9.6	15.8	1995
RDA-GV-07[1]	8	0.4	15.3	4248 (offscale)	2	0.1	16.0	0	0	0	12.5	0	41	2.1	16.7	2337
RDA-GV-08	0	0	17.6	0	0	0	16.3	0	0	0	17.1	12.9	0	0	20.2	76.6
RDA-GP-01	>1000 (offscale)	72.2	0.0	320	>100	29.7	3.0	2154	>100	57	0.0	>4127	>100	63.5	0.0	4
RDA-GP-02[1]	>1000 (offscale)	52.2	0.0	4248 (offscale)	>100	26.5	0.8	4493	>100	54.2	0.0	>3907	>100	58.7	0.1	nr
RDA-GP-03	0	0	12.7	0	2	0.1	19.7	0	0	0	10.2	0	17	0.9	1.3	nr
RDA-GP-04	222	11.4	2.6	4047	0	0	21.6	11.1	0	0	14.8	0	>100	11.7	0.0	2337
RDA-GP-05	194	9.5	4.3	420.6	24	1.4	17.8	4493	>100	13.2	0.7	>4223	NR	NR	NR	NR
RDA-GP-06	0	0	0.2	0	70	3.5	0.0	4493	>100	29.5	0.0	0	>100	20.2	0.0	2194
RDA-GP-07	0	0	18.8	0	1	0.1	20.0	0	0	0	15.6	0	19	1	9.1	3.5

TABLE 2-20
RDA SUMMARY OF LANDFILL GAS MONITORING - 2008
FIVE YEAR REVIEW
NAS SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS

Location	Sample Date											
	4/7/2008				6/14/2008				9/15/2008			
	Lower Explosive Limit (%)	Methane (%)	Oxygen (%)	VOCs (ppm) (FID)	Lower Explosive Limit (%)	Methane (%)	Oxygen (%)	VOCs (ppm) (FID)	Lower Explosive Limit (%)	Methane (%)	Oxygen (%)	VOCs (ppm) (FID)
GAS VENTS												
RDA-GV-01	0	0	21.2	0	12	0.6	20.1	nr	0	0	0.5	4939
RDA-GV-02	0	0	21.2	0	0	0	8.3	nr	0	0	22.2	19.1
RDA-GV-03	0	0	16.0	0	1	0.1	16.0	nr	0	0	22.4	20.1
RDA-GV-04	2	0.1	17.6	2172	10	0.5	20.2	nr	>100	9.7	1.1	7492
RDA-GV-05	0	0	20.0	0	0	0	13.6	nr	0	0	21.6	14.2
RDA-GV-06	11	0.6	21.3	2081	8	0.4	20.2	nr	>100	5.2	17.2	12149
RDA-GV-07	0.0	0	18.5	286	0.0	0	17.6	nr	0	0	17.5	89.9
RDA-GV-08	0	0	19.6	49	1	0.1	20.7	nr	0	0	21.8	260.6
GAS PROBES												
RDA-GP-01	>100	42.4	0.6	3445	>100	34	0.9	574.3	>100	58.7	0.0	5001
RDA-GP-02	>100	22.5	1.1	2882	>100	37.9	0.4	nr	>100	31.9	5.4	5300
RDA-GP-03	0	0	9.3	0	1	0.1	16.3	nr	0	0	13.3	565
RDA-GP-04	0	0	16.2	0	1	0.1	17.7	nr	>100	5.1	4.6	83
RDA-GP-05	86	4.3	1.5	14	39	2.4	14.4	nr	0	0	17.8	197
RDA-GP-06	37	1.9	1.5	3445	32	1.7	1.0	nr	>100	40.4	0.5	5025
RDA-GP-07	0	0	18.6	0	1	0.1	18.6	nr	0	0	18.6	203

Notes:

BKG - Background reading taken from outside gas probe / gas vent casing in breathing zone.

FID - flame ionization detector

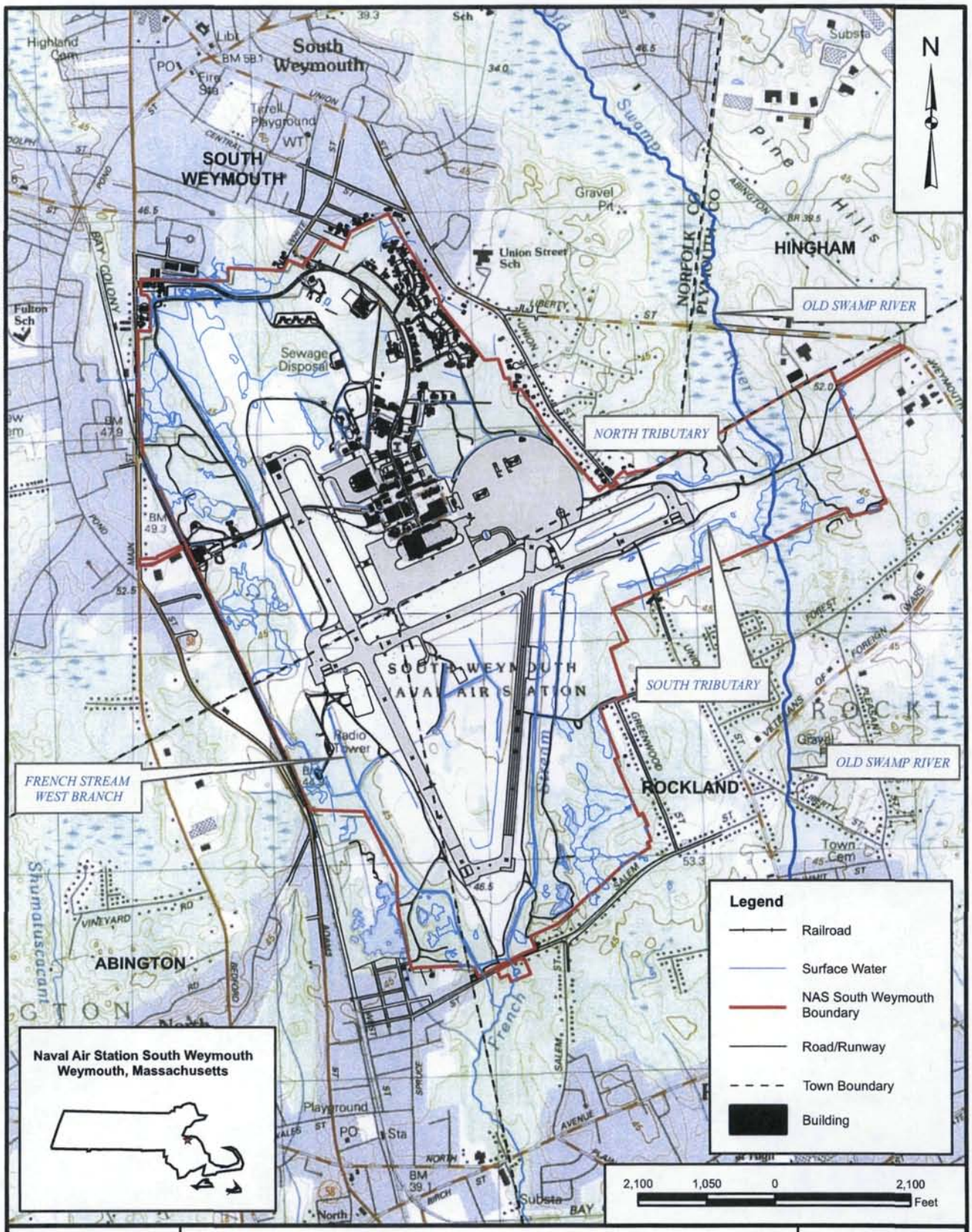
NR - no reading

ppm - parts per million

% - percent

FIGURES

P:\GIS\WEYMOUTH\MAPDOCS\MXD BASE_LOCATION_MAP.MXD 1/23/09 SP



Tetra Tech NUS, Inc.

BASE LOCATION MAP
FIVE-YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS

SCALE	AS NOTED
FILE	BASE_LOCATION_MAP.MXD
REV	0
DATE	1/23/09
FIGURE NUMBER	FIGURE NO. 1 - 1

P:\GIS\WEYMOUTH\MAPDOCS\MXD\ RDA_VICINITY.MXD 1/21/09 SP

Legend

- NAS South Weymouth Boundary
- Road/Pavement
- Fence
- Surface Water Lines (GPS)
- Surface Water Lines (Approximate)
- Flow Direction
- Storm Drain System
- Former PCB Excavation Area
- Topographic Contours (5-foot Interval)
- Rubble Disposal Area Boundary
- Building
- Wetland
- Conduit

RUBBLE DISPOSAL AREA

FEEDER STREAM

OLD SWAMP RIVER

FEEDER STREAM

RUNWAY 8-26

N

400 200 0 400 Feet

Tetra Tech NUS, Inc.

SITE VICINITY
RUBBLE DISPOSAL AREA
FIVE-YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS

FILE	SCALE
RDA_VICINITY.MXD	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE NO. 2 - 1	0 / 1/21/09

P:\GIS\WEYMOUTH\MAPDOCS\MXD RDA_MONITORING_FEATURES.MXD 1/21/09 SP

Legend

- Off Site Monitoring Well Location
- On-Site Monitoring Well and Piezometer Location
- Stream Piezometer and Staff Gauge Location
- Wetland Piezometer and Staff Gauge Location
- Gas Probe
- Gas Vent
- Surface Water Sample Location
- Surface Water and Sediment Sample Locations
- Road/Pavement
- Topographic Contours (5 foot Interval)
- Former PCB Excavation Area
- Surface Water Lines (GPS)
- Surface Water Lines (Approximate)
- Flow Direction
- Rubble Disposal Area Boundary
- Building
- Wetland
- Conduit

Note:
1) Monitoring well, piezometer, and staff gauge locations were surveyed.
2) Old Swamp River extends farther than shown in this figure. Point indicates where the river channel in the wetland area is no longer defined.

The river channel width is approximately 40 feet at this location.

The river channel width is approximately 25 to 30 feet at this location.

This location is approximately where the river channel narrows to a width of 3 to 5 feet.

The Rubble Disposal Area boundary is equivalent to the position of the wooden guard rail around the site.

N

120 60 0 120 Feet

Tetra Tech NUS, Inc.

MONITORING FEATURES
RUBBLE DISPOSAL AREA
FIVE-YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS

FILE	SCALE
RDA_MONITORING_FEATURES.MXD	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE NO. 2 - 2	0 / 1/21/09

P:\GIS\WEYMOUTH\MAPDOCS\MXD\ RDA_SW_SD_FEATURES.MXD 1/21/09 SP

Legend

- On-Site Monitoring Well and Piezometer Location
- Stream Piezometer and Staff Gauge Location
- Wetland Piezometer and Staff Gauge Location
- Gas Probe
- Gas Vent
- Sediment Sample Location
- Surface Water Sample Location
- Flow Direction
- Surface Water Lines (GPS)
- Former PCB Excavation Area
- Road/Pavement
- Topographic Contours (5 foot Interval)
- Building
- Wetland
- Conduit
- Rubble Disposal Area Boundary
- Surface Water and Sediment Sample Area

Note:
1) Monitoring well, piezometer, sediment, surface water, and staff gauge locations were surveyed.
2) The Rubble Disposal Area boundary is equivalent to the position of the wooden guard rail at the site.

RUBBLE DISPOSAL AREA

RDA-TT07

RDA-TT05

RDA-PZ04/RDA-G04

RDA-TT03

RDA-PZ06/RDA-G06

RDA-MW50D2

RDA-MW50D

RDA-TT02

120

125

130

135

RDA-SW01/RDA-SD01

RDA-SD01H
RDA-SD01G
RDA-SD01F
RDA-SD01E
RDA-SW01
RDA-SD01A
RDA-SD01C
RDA-SD01B
RDA-SD01D

RDA-SW02/RDA-SD02

RDA-G04
RDA-PZ04
RDA-SW02
RDA-SD02D
RDA-SD02C
RDA-SD02G
RDA-SD02B
RDA-SD02H
RDA-SD02A
RDA-SD02F
RDA-SD02E

RDA-SW03/RDA-SD03

RDA-SW03
RDR-SD03D
RDA-SD03G
RDA-SD03C
RDA-SD03
RDA-SD03B
RDA-G07
RDA-PZ07
RDA-SD03H
RDA-SD03F
RDR-SD03E
RDA-SD03A

RDA-SPZ101/RDA-G101

RDA-SW U

OLD SWAMP RIVER

N

45 22.5 0 45 Feet

Tetra Tech NUS, Inc.

SURFACE WATER AND SEDIMENT FEATURES
RUBBLE DISPOSAL AREA
FIVE-YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS

FILE	SCALE
RDA_SW_SD_FEATURES.MXD	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE NO. 2 - 3	0 / 1/21/09

P:\GIS\WEYMOUTH\MAPDOCS\MXD\ RDA_MAMMAL_SAMPLE_LOCATIONS.MXD 1/22/09 SP

Legend

- Off Site Monitoring Well Location
- On-Site Monitoring Well and Piezometer Location
- Stream Piezometer and Staff Gauge Location
- Wetland Piezometer and Staff Gauge Location
- Gas Probe
- Gas Vent
- Surface Water Sample Location
- Proposed Small Mammal Sample Location
- Road/Pavement
- Topographic Contours (5 foot Interval)
- Former PCB Excavation Area
- Surface Water Lines (GPS)
- Surface Water Lines (Approximate)
- Flow Direction
- Rubble Disposal Area Boundary
- Building
- Wetland
- Conduit

Note:
1) Monitoring well, piezometer, and staff gauge locations were surveyed.
2) Old Swamp River extends farther than shown in this figure. Point indicates where the river channel in the wetland area is no longer defined.

N

GRAVELLY BITUMINOUS ROAD

FEEDER STREAM

RDA-SPZ102/RDA-G102
RDA-SWD

RDA-PZ05

GP-01

GP-02

GV-08

ET-01

RDA-TT01

GP-03

RDA-TT06

GV-07

ET-02

RDA-TT02

RUBBLE DISPOSAL AREA

GP-04

GV-06

RDA-SPZ101/RDA-G101
RDA-SWU

OLD SWAMP RIVER

RDA-MW50D2
RDA-MW50D

MW01-064

GATE

GP-05

RDA-TT07

RDA-MW05

GV-04

ET-03a

RDA-PZ04/RDA-G04
RDA-TT03

GV-05

GP-06

RDA-TT05

RDA-PZ06/RDA-G06

GV-03

RDA-PZ07/RDA-G07

GP-07

ET-03b

RDA-TT04

RDA-PZ03/RDA-G03

GV-01

GV-02

ET-03c

RDA-PZ02/RDA-G02

RDA-PZ01/RDA-G01

The Rubble Disposal Area boundary is equivalent to the position of the wooden guard rail around the site.

120 60 0 120 Feet

Tetra Tech NUS, Inc.

SMALL MAMMAL SAMPLE LOCATIONS
RUBBLE DISPOSAL AREA
FIVE-YEAR REVIEW
NAS SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS

FILE	SCALE
RDA_MAMMAL_SAMPLE_LOCATIONS.MXD	AS NOTED
FIGURE NUMBER: FIGURE NO. 2 - 4	REV: 0 / DATE: 1/22/09

Figure 2-5
RDA Manganese Concentrations in Groundwater
Five Year Review
NAS South Weymouth
Weymouth, Massachusetts

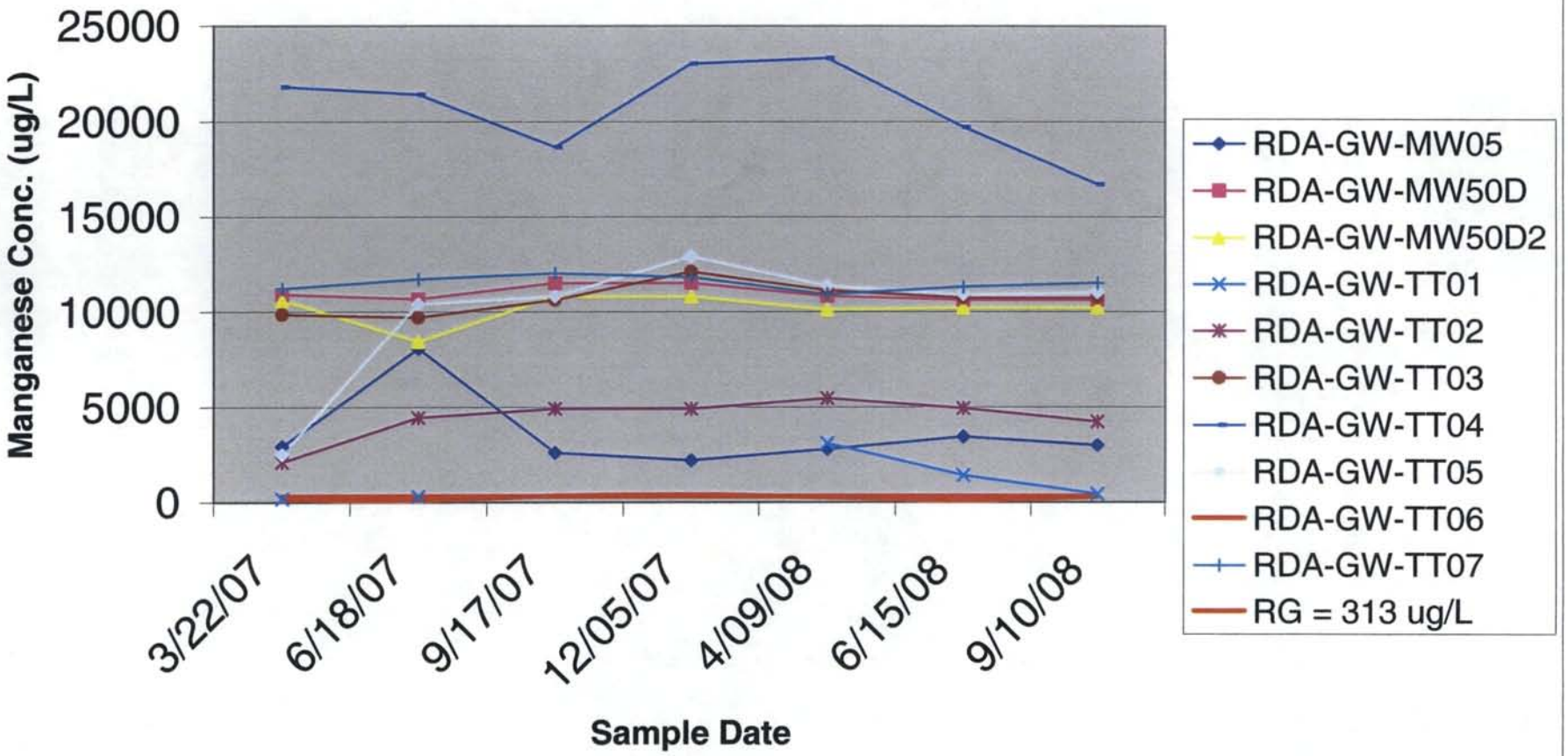


Figure 2-6
RDA Arsenic Concentrations in Groundwater
Five Year Review
NAS South Weymouth
Weymouth, Massachusetts

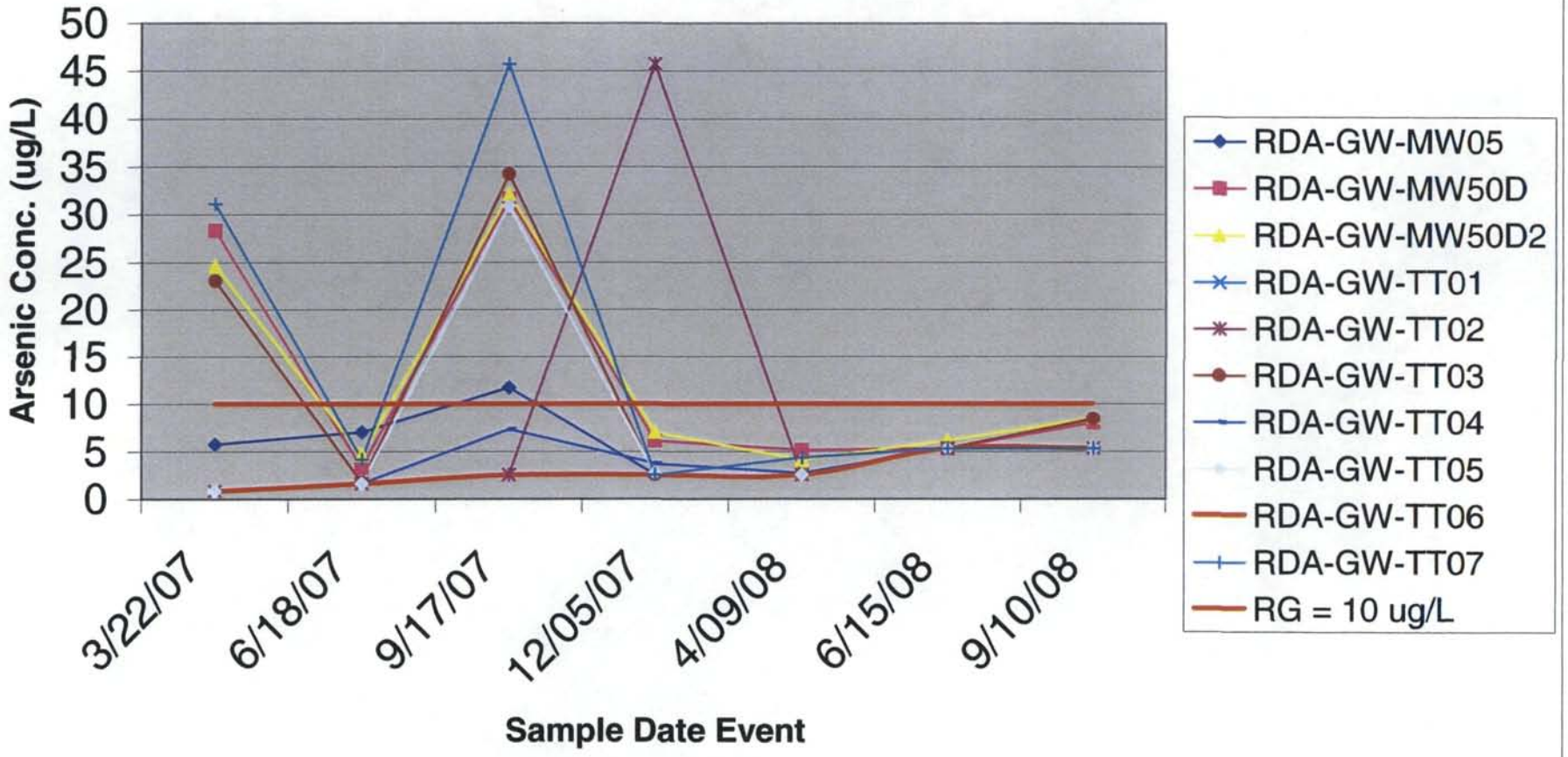


Figure 2-7
RDA Gas Probes Percent Methane - 2007 & 2008
Five Year Review
NAS South Weymouth
Weymouth, Massachusetts

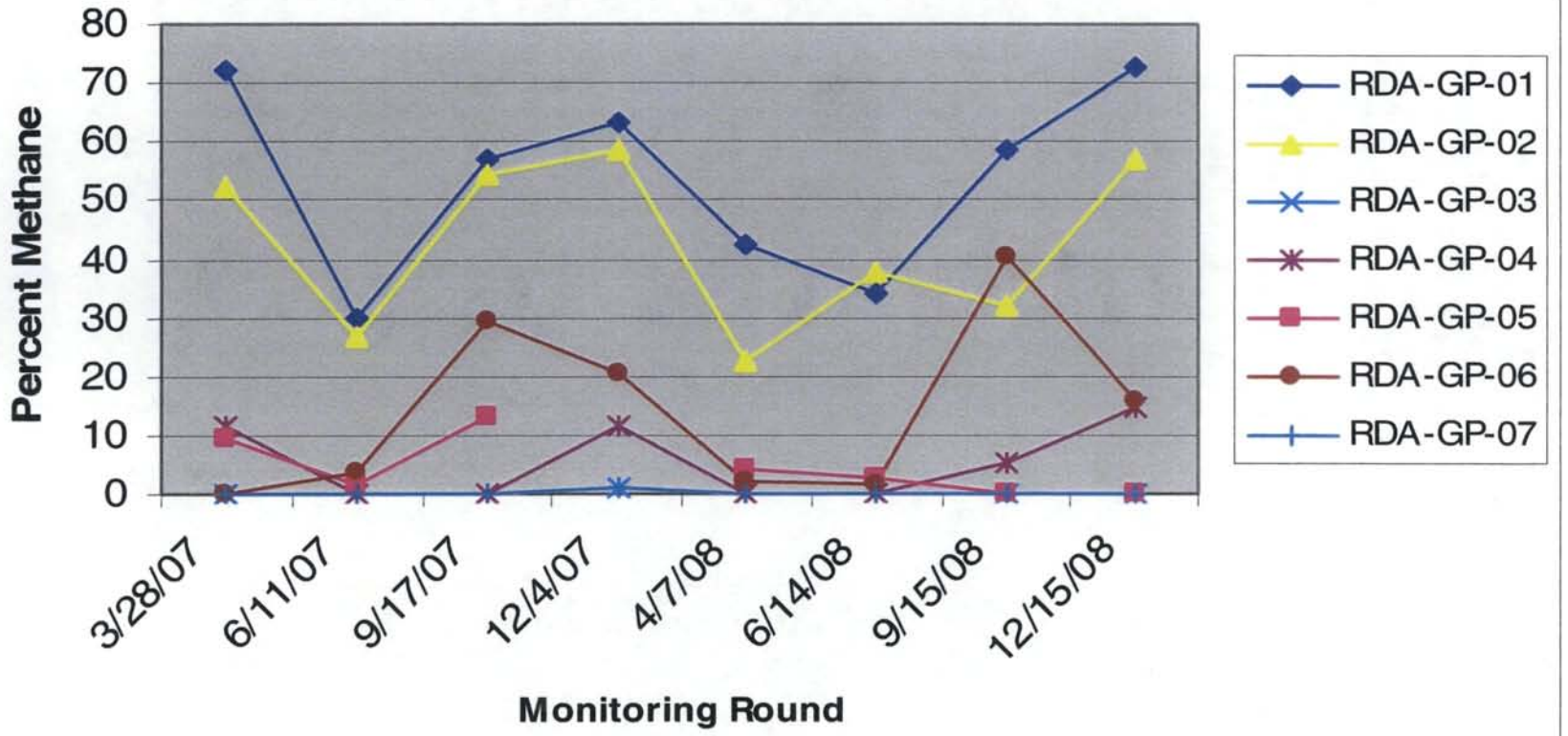
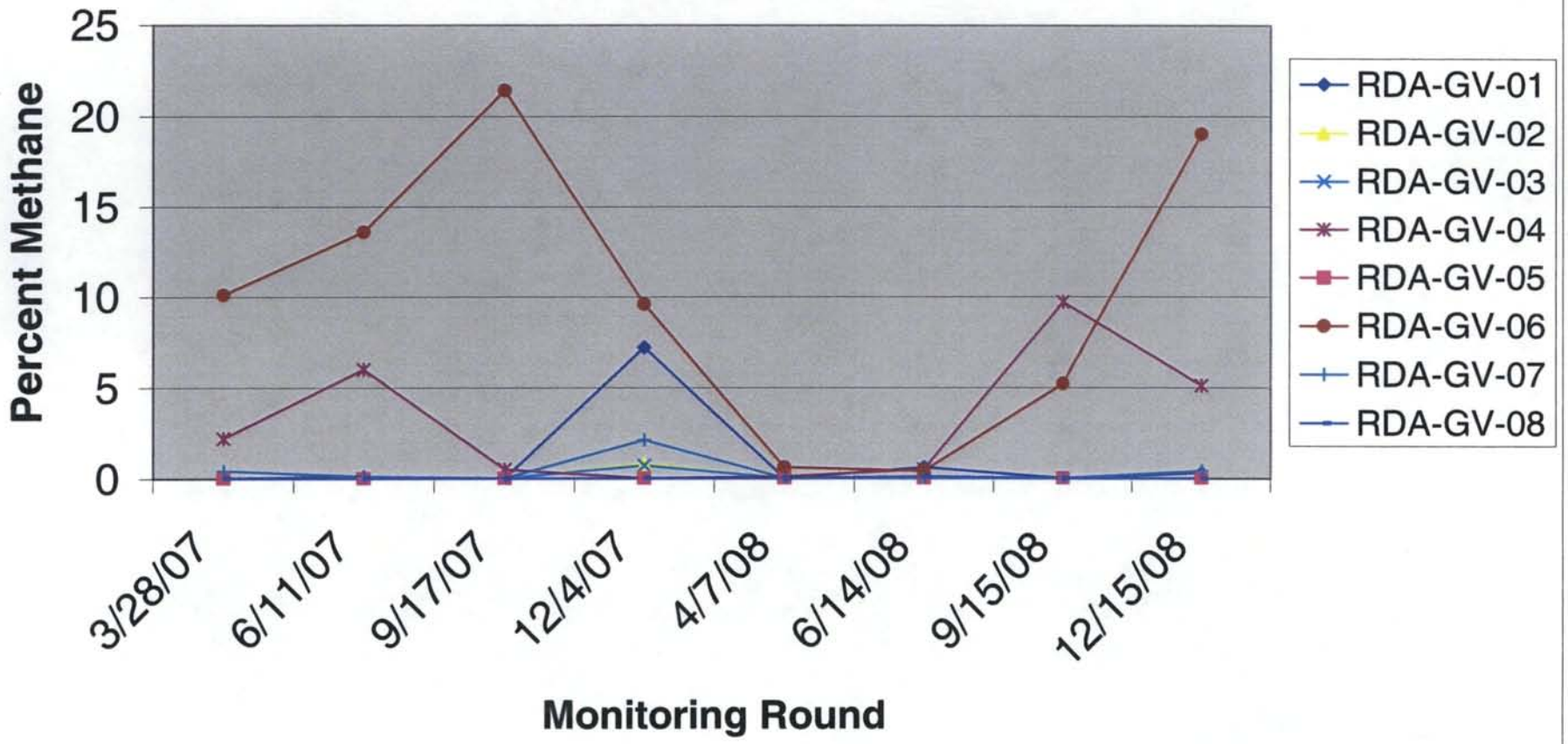


Figure 2-8
RDA Gas Vents Percent Methane - 2007 & 2008
Five Year Review
NAS South Weymouth
Weymouth, Massachusetts



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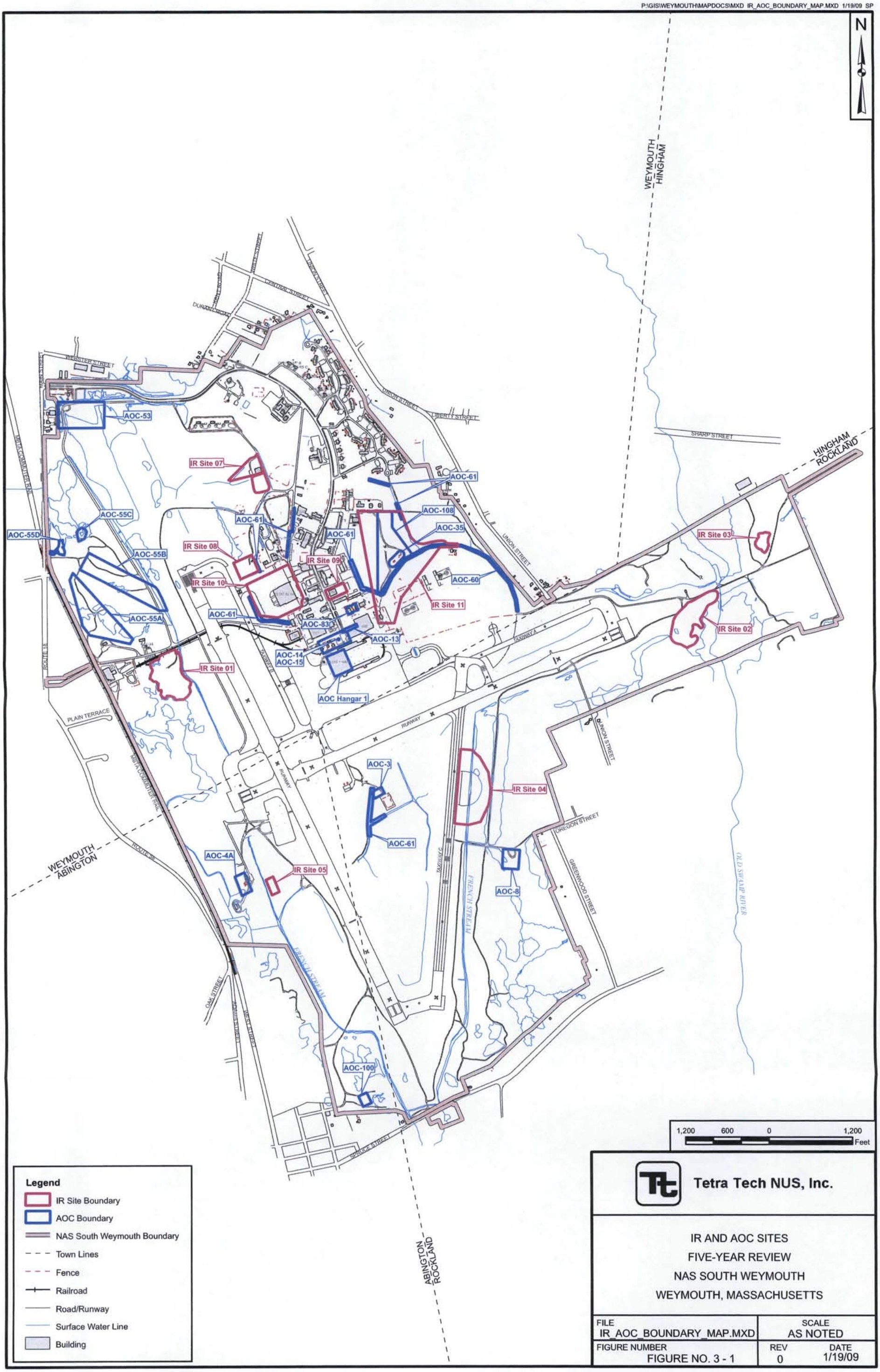

APPENDIX A

APPENDIX A

DOCUMENT REVIEW LIST/REFERENCES

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Tetra Tech NUS, Inc., 2008c. *Quality Assurance Project Plan Addendum 1 for Long-Term Monitoring, Rubble Disposal Area, Operable Units 2 and 9, Naval Air Station South Weymouth, Weymouth, Massachusetts.* Mid-Atlantic Division Naval Facilities Engineering Command Contract Number N62467-04-D-0055. August.

Tetra Tech NUS, Inc., 2008d. *Draft Long-Term Monitoring Report Quarterly Round 1 -2008, Rubble Disposal Area, Operable Units 2 and 9, Naval Air Station South Weymouth, Weymouth, Massachusetts.* Mid-Atlantic Division Naval Facilities Engineering Command Contract Number N62467-04-D-0055. December.

Tetra Tech NUS, Inc., 2008e. *Draft Long-Term Monitoring Report Quarterly Round 2 -2008, Rubble Disposal Area, Operable Units 2 and 9, Naval Air Station South Weymouth, Weymouth, Massachusetts.* Mid-Atlantic Division Naval Facilities Engineering Command Contract Number N62467-04-D-0055. December.

Tetra Tech NUS, Inc., 2008f. *Draft Long-Term Monitoring Report Quarterly Round 3 -2008, Rubble Disposal Area, Operable Units 2 and 9, Naval Air Station South Weymouth, Weymouth, Massachusetts.* Mid-Atlantic Division Naval Facilities Engineering Command Contract Number N62467-04-D-0055. December.

APPENDIX B

APPENDIX B

SITE INSPECTION REPORT AND PHOTOGRAPHS

Rubble Disposal Area (IR Site 2) Site Inspection – November 21, 2008
Five Year Review

Attendees:

Jim Ropp, P.E. - Tetra Tech NUS, Inc.
Thomas Campbell - Tetra Tech NUS, Inc.

The site inspection commenced at approximately 11:00 AM and concluded approximately 2:30 PM. The weather was sunny and clear with a light breeze and a temperature of approximately 35 degrees. Observations made by the inspection team are noted below.

Site Inspection Notes:

The inspection began at the gravel parking area located outside the northwest perimeter of the landfill. Slight vehicle ruts were observed in the parking area. A metal gate providing access to the landfill surface was secured with a lock and the gate was in good condition. A metal sign warning of the presence of a closed landfill was observed affixed to the wood guard rail adjacent to the gate. Overall the sign was in good condition, but dents from target shooting were evident. A second older wooden sign, in the same area, was observed face down on the ground adjacent to the wooden railing.

The inspection then progressed south along the landfill perimeter in a counter clockwise direction. The landfill cap vegetation appeared to be healthy and well established. Gas vents enclosed in chain link fencing were observed on the surface of the landfill. Several gas vents appeared to be slightly tilted and one was observed with an animal burrow at its base (GV-02). Gas ports were observed along the perimeter of the landfill flush to the ground surface. The landfill cap appeared to be smooth with several observed undulations and slight depressions.

Shallow vehicle ruts were noted along the perimeter of the landfill cap. The tag end of geotextile fabric which lines the drainage rip rap strip was observed protruding in several locations. It was noted that although brush and vegetation had been recently cleared from the rip rap, some grass and low lying vegetation was still present in the rip rap. The southern benchmark spike was located on a large tree which had fallen over.

The gabion wall was observed to be in good condition at the southern end of the landfill. One fence post near the gabion wall appeared to be slightly exposed from erosion. The rip rap adjacent to the gabion wall exhibited evidence of a slight amount of outwash from the landfill cap. Gas vent no. 1 was observed to be in good condition. The vent was upright and locked. Adjacent to the vent was a mossy area with sparse grass cover. North of the vent was a low area that might indicate slight settling of the landfill cap.

The created wetland located adjacent to the southeast perimeter of the landfill was observed to be healthy. A slight sheen was noted in ponded water in the wetland.

Gas vent no. 2 was observed to have a slight tilt. An animal burrow was present at the base of the gas vent PVC pipe. The gas vent appeared to be in good condition and was locked. Some mossy areas bare of grass and several vehicle ruts were also observed near this gas vent.

Several small areas of erosion were observed along the riprap along the southeast perimeter of the landfill. Some these erosion areas were associated with vehicle ruts and were, at a maximum, four inches in depth. In addition, geotextile fabric which underlies the rip rap was observed protruding on the surface in several areas. Turtle bridges observed in this area appeared in generally good condition, although several had small animal burrows and some protruding geotextile fabric. Two small saplings were observed in the rip rap area to the northeast of the landfill cap. An area of iron floc was observed in the wetland adjacent to monitoring wells RDA-MW50D and RDA-MW50D2.

The northern perimeter of the landfill was observed next. The northern drainage swale appeared in good condition. Evidence of slight outwash of rip rap was observed along the base of the conduits. An approximately 20 foot long section of geotextile fabric was observed protruding from the drainage swale. A small amount of vegetation, grass and low bushes, was observed in the drainage swale.

ATV ruts were observed in the area north of the landfill. Two vandalized landfill warning signs were observed with bullet holes. The northern benchmark was observed cut into the former landing approach light structure. Upstream surface water sample location and stream piezometer no. 102 was observed north of the conduits.

The northern drainage swale was inspected along its extent. Small portions of geotextile fabric were observed in several areas. Several bushes, saplings, and tufts of grass were noted along the edge and inside the swale. The gas probes in this area appeared locked and in good condition.

The inspection then proceeded to the central portion of the landfill cap. Gas vents were inspected and were observed to be in good condition. An animal burrow was observed at the base of gas vent no. 4. The vent pipe also had a slight tilt. Gas vent no. 6 had a missing gas sampling port. The vegetative cover on the landfill appeared generally healthy. Several small bare areas with moss were observed. Small shrubs were noted in two areas growing on the cap surface.

Following the landfill recon, TtNUS personnel observed the off-base areas to the south, east and north of the RDA. Within the city limits of Rockland, Forest Street abutted woodlands south of the RDA. The area was primarily residential. The area abutting the base to the east was primarily commercial. The abutting area to the north consisted of commercial and residential areas. New residential construction was observed on Union Street during the site reconnaissance.

Date: 11/21/2008 Picture No. 1 Location: RDA
Comment: Warning signs posted at main access gate

Date: 11/21/2008 Picture No. 2 Location: RDA
Comment: Main access gate and warning signs

Date: 11/21/2008 Picture No. 3 Location: RDA
Comment: Site identification sign adjacent to main access gate

Date: 11/21/2008 Picture No. 4 Location: RDA
Comment: View of rip rap along the western boundary of landfill

Date: 11/21/2008 Picture No. 5 Location: RDA

Comment: Moss area on southern portion of landfill cap

Date: 11/21/2008 Picture No. 6 Location: RDA

Comment: Unidentified sheen located in south wetland area

Date: 11/21/2008 Picture No. 7 Location: RDA

Comment: View of gabion basket located along western boundary of landfill cap

Date: 11/21/2008 Picture No. 8 Location: RDA

Comment: View of piezometer (PZ-01) located in the southern wetland area

Date: 11/21/2008 Picture No. 9 Location: RDA
Comment: View of tire ruts on the southern portion of the landfill cap

Date: 11/21/2008 Picture No. 10 Location: RDA
Comment: View of gas vent (GV-02) located on southern landfill cap

Date: 11/21/2008 Picture No. 11 Location: RDA
Comment: View of animal burrow in base of gas vent GV-02

Date: 11/21/2008 Picture No. 12 Location: RDA
Comment: View of erosion ruts on southern portion of cap (see pen for size reference)

Date: 11/21/2008 Picture No. 13 Location: RDA

Comment: View of created wetlands in the vicinity of piezometer PZ-07

Date: 11/21/2008 Picture No. 14 Location: RDA

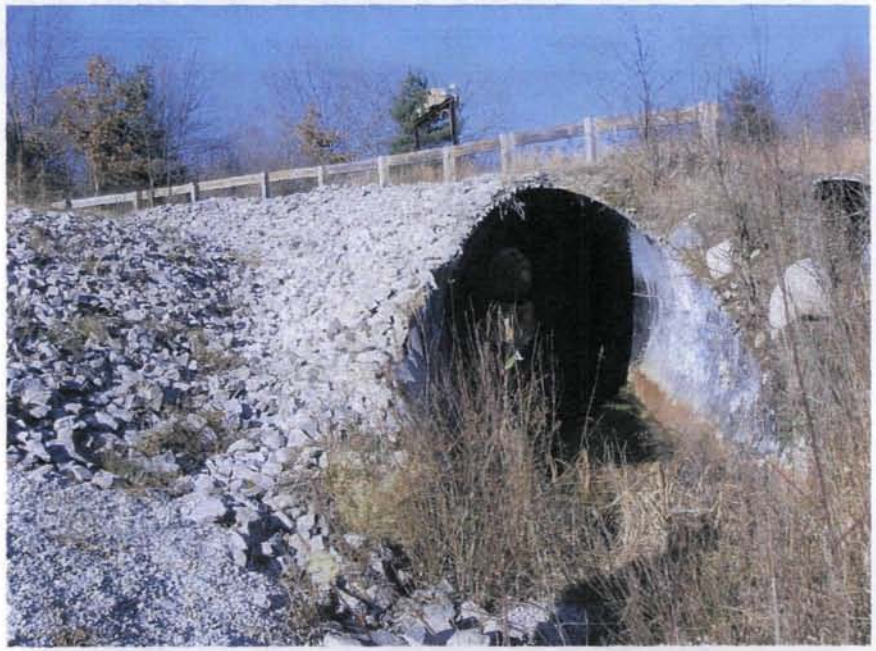
Comment: View of rip rap along eastern boundary of landfill cap

Date: 11/21/2008 Picture No. 15 Location: RDA

Comment: View of monitoring wells MW-50D and MW-50D2 along eastern landfill boundary

Date: 11/21/2008 Picture No. 16 Location: RDA

Comment: View of PCB excavation area and associated grass cover

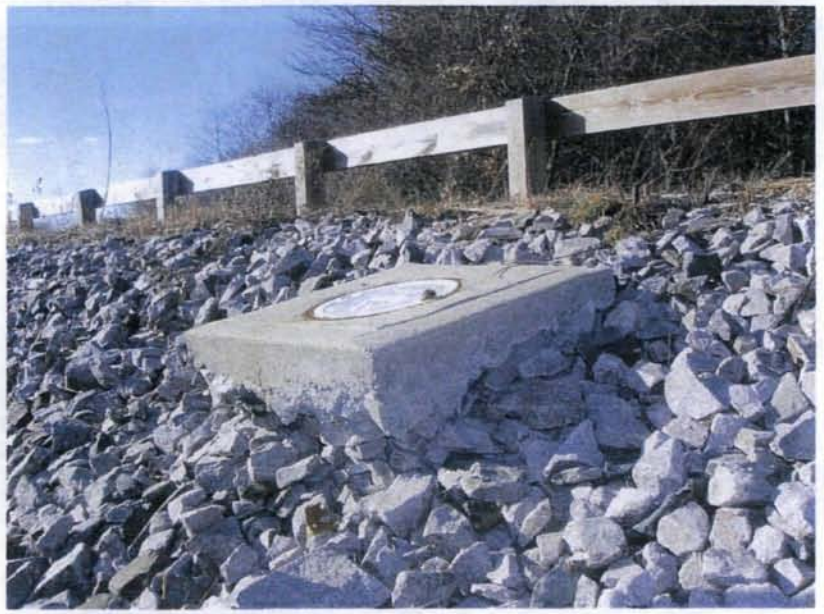


Date: 11/21/2008 Picture No. 17 Location: RDA
Comment: View of one of the conduits located north of the landfill

Date: 11/21/2008 Picture No. 18 Location: RDA
Comment: View of warning signs located along northern landfill boundary

Date: 11/21/2008 Picture No. 19 Location: RDA
Comment: View of ATV ruts outside northern landfill boundary

Date: 11/21/2008 Picture No. 20 Location: RDA
Comment: View of northern drainage swale looking north



Date: 11/21/2008 Picture No. 21 Location: RDA

Comment: View of gas port GP-02 located along northwestern boundary of landfill

Date: 11/21/2008 Picture No. 22 Location: RDA

Comment: View of tire ruts and monitoring well RDA-TT01 northwest of the landfill cap

Date: 11/21/2008 Picture No. 23 Location: RDA

Comment: View of landfill cap looking towards the north

Date: 11/21/2008 Picture No. 24 Location: RDA

Comment: View of monitoring well RDA-TT07 located in central portion of the landfill cap

APPENDIX C

APPENDIX C

INTERVIEW RECORDS

INTERVIEW RECORD

Site Name: NAS South Weymouth – 5 YR		**EPA ID No.:**	
Subject: First Five-Year Review		**Time:** 1100 hrs	**Date:** 11/25/2008
Type: Telephone **X** Visit ☐ Other ☐			
Contact Made By:			
Name: Tom Campbell	**Organization:** Tetra Tech NUS	**Phone:** 978-658-7899	
Individual Contacted:			
Name: Richard Packard	**Organization:** South Shore Tri Town	**Phone:** 781-682-2187	

Summary of Conversation

Mr. Packard was the former facilities manager for the Navy now works for SSTT with leases and licenses on property SSTT owned before transfer to developer.

Mr. Packard's main concern was trespassing, especially near RDA. He stated that trespassers gained access from Forest Street thru old fire roads. Trespassers are young kids on ATVs and dirt bikes. He stated that this has been a constant nuisance. The Nave fence has been repaired in the past but vandalized right away. Boulders have been used, but now moved away. Police Department has been called, not effective. Most trespassing occurs on weekends and school vacations. Town of Rockland needs to help with access issue – more boulders, jersey barriers to limit access off Forest Street.

INTERVIEW RECORD

Site Name: NAS South Weymouth – 5 YR		**EPA ID No.:**
Subject: First Five-Year Review		**Time:** 0845 hrs **Date:** 12/09/2008
Type: Telephone **X** Visit □ Other □		
Contact Made By:		
Name: Tom Campbell	**Organization:** Tetra Tech NUS	**Phone:** 978-658-7899
Individual Contacted:		
Name: Janice McCarthy	**Organization:** Rockland Board of Health	**Phone:** 781-871-0154

Summary of Conversation

Ms. McCarthy called to discuss the 5 Year interview questions. She stated that she did not receive many inquires regarding the Base. When she started her position in 2001 there were more. She attributes this to public participation in RAB meetings and public hearings.

Ms. McCarthy mentioned one issue – illegal dumping of residential waste along Spruce Street and base fencing.

Ms. McCarthy feels that she is well informed about environmental clean up activities and she keeps copies of all Navy deliverables for public requests.

INTERVIEW RECORD

Site Name: NAS South Weymouth – 5 YR	**EPA ID No.:**	
Subject: First Five-Year Review	**Time:** 1000 hrs	**Date:** 12/03/2008
Type: Telephone X Visit ☐ Other ☐		

Contact Made By:

Name: Tom Campbell	**Organization:** Tetra Tech NUS	**Phone:** 978-658-7899

Individual Contacted:

Name: Michael Bromberg	**Organization:** RAB Member	**Phone:** 781-681-816

Summary of Conversation

Mr. Bromberg called to provide his input into the NAS South Weymouth 5YR. He commented that the RDA 2007 annual report and 2008 quarterly reports were not available to the public for review and this made it difficult to evaluate the RDA monitoring. With regard to other sites, he was concerned with the hold up regarding WGL, the iron floc evaluation, and the Basewide watershed report. WGL has been sitting for 11 years on a water body and no action has been taken. Has an eco or human health risk assessment been completed for the iron floc? It should have been determined if and communicated to the public if there is a safety issue. Has the Basewide report been completed? Mr. Bromberg had concerns with the placement of restrictions on contaminated sites verse cleaning them up. Examples he listed were placing groundwater use restrictions on plume sites and fencing sites instead of cleaning them. Mr. Bromberg had no issues with trespassing at the RDA and remarked that the clean-up at RDA was generally great. Several other sites were mentioned as positives – RIA 100/108 and FFTA.

Mr. Bromberg commented that other residents located on Forest Street, Rockland were probably unaware of the existence of RDA to the north. He felt there was a low level of interest in activities at the base.

He felt it was positive to have a BRAC coordinator on base and it would be better if the public could view sites on base.

The document repository at the caretaker's office was useful.

Regarding the remedy implemented at RDA, he felt the Navy ignored the public's opposition to the remedy.

INTERVIEW QUESTIONS
NAS SOUTH WEYMOUTH - 1st FIVE-YEAR REVIEW

Please use other side for additional comments.

1. What is your overall impression of the remedial actions conducted or planned at the Base?
   My impression is that they (SSTTDC) are conducting sufficient remedial actions to assure the public health and safety of the future occupants
2. Have Navy's environmental cleanup activities had any effects on the surrounding communities?
   Not to my knowledge.
3. Are you aware of any community concerns regarding cleanup activities at the Base? Please provide details.
   None that I am aware of
4. Are you aware of any complaints, incidents, unusual activities (vandalism, trespassing), or emergency responses by local authorities at any of the active environmental sites?
   No.
5. Do you feel well informed about the environmental cleanup activities and progress?
   No. But I am not the municipal person that would be concerned with cleanup activities
6. Do you have any comments, suggestions, or recommendations regarding the management of the active environmental sites?
   No.

Name: Debbie Crane

Title: Land Planner

Organization/Community: Abington

Please return to: Mr. Brian Helland, Remedial Project Manager
BRAC Program Management Office Northeast
4911 South Broad Street, Philadelphia, PA 19112
e-mail: brian.helland@navy.mil

Peter Seward/Tom Campbell
fax to: Tetra Tech NUS 978-474-8499

INTERVIEW QUESTIONS
NAS SOUTH WEYMOUTH - 1st FIVE-YEAR REVIEW

Please use other side for additional comments.

1. What is your overall impression of the remedial actions conducted or planned at the Base?
   very good.
2. Have Navy's environmental cleanup activities had any effects on the surrounding communities?
   No
3. Are you aware of any community concerns regarding cleanup activities at the Base? Please provide details.
   No
4. Are you aware of any complaints, incidents, unusual activities (vandalism, trespassing), or emergency responses by local authorities at any of the active environmental sites?
   No
5. Do you feel well informed about the environmental cleanup activities and progress?
   yes
6. Do you have any comments, suggestions, or recommendations regarding the management of the active environmental sites?
   No

Name: Michelle Roberts

Title: HEALTH OFFICER

Organization/Community: Abington BOARD OF HEALTH

Please return to: Mr. Brian Helland, Remedial Project Manager
BRAC Program Management Office Northeast
4911 South Broad Street, Philadelphia, PA 19112
e-mail: brian.helland@navy.mil

Response to Interview Questions for the 5 year review NAS South Weymouth
11/20/2008
by
Dan McCormack, Environmental Specialist
Weymouth Health Department

Response to Question #1:
Overall the closure of the RDA is appropriate, landfill capping is common practice in Massachusetts and throughout the country and thus far the site monitoring has been comprehensive. There is however concern regarding the production/discharge of methane gas in the landfill and Arsenic and Manganese levels in the groundwater.

Response to Question #2
There is a general concern of the people who attend the RAB meetings as to the future use of the site. The site is planned for open space. Is a capped landfill a safe place for people to recreate?

Response to Question #3
Not to date

Response to Question #4
Detected levels to methane gas in excess of 25% LEL and levels of Arsenic (3xMMCL) and Manganese (max 18,900 ug/l) in the groundwater are concerns associated with the monitoring results. It is critical that these chemicals be strictly monitored and maintenance activities occur to ensure future human health and safety.

Response to Question #5
There are volumes of information available on the RDA. It would be helpful to have a summary document with monitoring results highlighting all chemicals in excess of standards or remedial goals and any possible health and environmental risks associated with them

Response to Question #6
As development begins in that area, it will be imperative to continue a stringent monitoring program for methane, arsenic, manganese and other compound to prevent any possible risk to site workers or occupants.

APPENDIX D

APPENDIX D

NOTIFICATIONS

Legals Legals

Five-Year Review
Former Naval Air Station South Weymouth
Weymouth, Massachusetts

The Department of the Navy, in cooperation with the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP), has begun a five-year review of the remedies implemented at the former Naval Air Station South Weymouth, Weymouth, Massachusetts. The purpose of the five-year review is to ensure that the selected remedies are effectively protecting public health and the environment. The five-year review process is mandated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (also known as Superfund) for sites where the selected remedial action results in contaminants remaining above levels that allow for unlimited use and unrestricted exposure. The Navy's Policy for Conducting Five-Year Reviews under the CERCLA Program and EPA's Comprehensive Five-Year Review Guidance will be used in the preparation of this review. This first five-year review for NAS South Weymouth will focus on the Rubble Disposal Area, where a remedial action has been implemented.

The Navy will conduct interviews, review reports, and assess site conditions to evaluate if the remedies remain protective of human health and the environment. Public participation is encouraged and welcomed. If you are interested in participating in the interview process, please contact Brian Helland at (215) 897-4912 or the address noted below.

Mr. Brian Helland
Remedial Project Manager
BRAC Program Management Office Northeast
4911 South Broad Street
Philadelphia, PA 19112
e-mail: brian.helland@navy.mil

10/21/08

Legal Notices

RDA-5YR

LEGAL NOTICE
Five-Year Review
Former Naval Air Station
South Weymouth
Weymouth, Massachusetts

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AD#11801551
Weymouth News 10-22-08

Legal Notices

RDA - 5 YR

LEGAL NOTICE
Five-Year Review
Former Naval Air Station
South Weymouth
Weymouth, Massachusetts

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The Navy will conduct interviews, review reports, and assess site conditions to evaluate if the remedies remain protective of human health and the environment. Public participation is encouraged and welcomed. If you are interested in participating in the interview process, please contact Brian Helland at **(215) 897-4912** or the address noted below.

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AD#11801573
Rockland Standard 10-24-08

FIRST 5-YEAR REVIEW
NAS SOUTH WEYMOUTH

Restoration Advisory Board Meeting
November 13, 2008

Phoebe Call
Tetra Tech NUS

Tonight's Objectives

- Describe the purpose of a 5-year review.
- Discuss the components of the review.
- Describe the community involvement process.
- Describe the contents of the report.
- Present the schedule for completion of the 5-year review.

What is a 5-Year Review?

- Under CERCLA § 121(c), if a remedial action results in hazardous substances or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the remedial action must be reviewed every five years to assure that human health and the environment are being protected.

5-year review triggering action date:

Start of RDA remedial action, July 2004. Thus the first 5-year review is due July 2009.

Roles, Responsibilities & Guidance

- Navy – the lead agency.
  - Ref.: *Navy's Policy for Conducting Five-Year Reviews under the Installation Restoration Program.*
- EPA – a supporting agency; reviews, comments and concurs with the protectiveness determination.
  - Ref.: *EPA Comprehensive Five-Year Review Guidance.*
- MassDEP – a supporting agency; reviews and comments on the 5-year review.

Purpose of a 5-Year Review

To determine whether the remedy implemented at a site is protective of human health and the environment. This is done by answering the following three questions:

1. Is the remedy functioning as intended?
2. Are the assumptions used when the remedy was selected still valid?
3. Has any other information come to light that could call into question the protectiveness of the remedy?

Components of a 5-Year Review

- Review of Site Documents
- Site Inspection
- Interviews
- Data Review
- Technical Assessment
- Report Preparation
- Recommendations & Follow-up Actions

CERCLA Sites Included in This 5-Year Review

- Sites with an implemented remedy – full review:
  - Rubble Disposal Area
- All other CERCLA sites (IR Sites and Areas of Concern) – status summary:
  - IR sites with RODs that require a remedy: WGL, STP, Small Landfill (closure under state regulations)
  - IR sites under investigation: Building 81, Building 82, SRA
  - AOC sites under investigation: AOC 14, AOC 55C, AOC 83, Hangar 1
  - List of IR and AOC sites completed with NA/NFA.

Community Involvement

Purpose: collect information about the status of the implemented remedy and other site concerns.

- Notification of the 5-year review – legal notice in local newspapers, tonight's RAB presentation
- Contact/interview MassDEP, SSTTDC
- Interview town officials – town clerk, planning board, board of health, libraries
- Interview RAB and community members
- Present the findings of the 5-year review to the RAB

Typical Interview Questions

1. What is your overall impression of the project?
2. Are you aware of any community concerns regarding the sites, or the cleanup activities?
3. Are you aware of any complaints, incidents, unusual activities, or emergency responses by local authorities at the sites?
4. Are you aware of any problems, concerns associated with on-going monitoring and maintenance activities?
5. Do you feel well informed about the cleanup activities and progress?
6. Do you have any comments, suggestions, or recommendations regarding the management of the sites?

Report Contents

- Site history and background information
- Remedial action selection and implementation
- Operations and maintenance (if applicable)
- Site inspection observations
- Summary of site interviews
- Data review
- Technical assessment (address the 3 questions)
- Deficiencies
- Recommendations and required actions
- Protectiveness statement

APPENDIX E

ARAR TABLES

ARARS AND TBCS ASSOCIATED WITH ALTERNATIVE RDA-5: EXCAVATION AND OFFSITE DISPOSAL OF PCB MATERIAL, AND PERMEABLE SOIL CAP FOR LANDFILL MATERIAL
RDA
NAS SOUTH WEYMOUTH, MASSACHUSETTS

Media	Requirement	Requirement Synopsis	Action to be Taken to Attain Requirement	Status
Federal – Location-Specific				
Wetlands	US Army Corps of Engineers, New England District (USACE-NAE) Mitigation Guidance	This guidance provides measures depicting *Mitigation Special Conditions, Sample Monitoring Report, and Checklist for Review of Mitigation Plan.*	If a remedial action involves disruption or potential impacts to the adjacent wetlands, this guidance would be pertinent.	To Be Considered
Wetlands	National Environmental Policy Act (NEPA), Wetlands, Floodplains, Important Farmland, Coastal Zones, Wild and Scenic Rivers, Fish and Wildlife Endangered Species 40 CFR Part 6	These regulations contain the procedures for complying with the executive order on wetland protection (EO 11990). Under this order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance natural and the beneficial values of wetlands. Requires that no remedial alternative adversely affect a wetland if another practicable alternative exists. If no such alternative exists, impacts from implementation must be mitigated.	Appropriate federal agencies would be contacted and allowed to review the proposed work plan for the remedial action prior to implementation of the action. Under this alternative, there is no practicable alternative that would have a less adverse impact on the aquatic ecosystem. Remedial activities would be scheduled and designed to minimize harm to the wetlands to the extent possible and any adverse impacts would be mitigated through wetland restoration.	Applicable
Wetlands	Fish and Wildlife Coordination Act 40 CFR Part 320.3 (16 USC 661 et seq.)	Requires that the U.S. Fish and Wildlife Services and National Marine Fisheries Service be consulted prior to structural modification of any stream or other water body (i.e., wetland). It also requires adequate protection of fish and wildlife resources. Requires consultation with state agencies to develop measures to prevent, mitigate, or compensate for project-related losses to fish and wildlife.	This alternative would include excavation within the wetlands adjacent to the former disposal area, and no practicable alternative exists. Actions taken would minimize adverse impacts to fish and wildlife. Relevant federal and state agencies would be contacted and allowed to review the proposed work plan for the remedial action prior to implementation of the action.	Relevant and Appropriate

ARARS AND TBCS ASSOCIATED WITH ALTERNATIVE RDA-5: EXCAVATION AND OFFSITE DISPOSAL OF PCB MATERIAL, AND PERMEABLE SOIL CAP FOR LANDFILL MATERIAL (CONTINUED)

RDA

NAS SOUTH WEYMOUTH, MASSACHUSETTS

Media	Requirement	Requirement Synopsis	Action to be Taken to Attain Requirement	Status
Floodplains	NEPA, Floodplain Management 40 CFR Part 6, Appendix A	Appendix A sets forth policy for carrying out the executive order on Floodplain Management (EO 11988). EO 11988 requires that a cleanup in a floodplain not be performed unless a determination is made that no practicable alternative exists. If no practicable alternative exists, potential harm must be minimized and action taken to restore and preserve the natural and beneficial values of the floodplain.	This alternative would include the excavation within the wetlands adjacent to the former disposal area, which is also within the 100-year floodplain of Old Swamp River. No practicable alternative to this excavation exists. Appropriate federal agencies would be contacted and allowed to review the proposed work plan for the remedial action prior to implementation of the action. Remedial activities would be scheduled and designed to minimize harm to the floodplains to the extent possible.	Applicable
Water	Clean Water Act (CWA) 404 (b) (1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material	Section 404 of the CWA regulates the discharge of dredged or fill material into U.S. waters, including wetlands. The purpose of section 404 is to ensure that proposed discharges are evaluated with respect to impacts on the aquatic ecosystem. No activity that adversely affects a wetland is permitted if a practicable alternative that has less effect is available. If there is no other practicable alternative, impacts must be mitigated.	Remedial activities would involve dredged or fill material discharge to wetlands. Under this alternative, there is no practicable alternative to this discharge; however any adverse impacts would be mitigated.	Relevant and Appropriate
Water	Rivers and Harbors Act Section 10, 33 U.S.C. 403, 33 CFR Parts 320-323	Section 10 of the Rivers and Harbors Act is implemented through a federal regulatory program administered by the U.S. Army Corps of Engineers (USACOE). It covers dredging, filling, excavation and placement of structures in all wetlands, tidal waters and navigable freshwaters.	Actions taken would minimize adverse impacts to the nearby Old Swamp River and comply with the environmental standards in 33 CFR Parts 320-323. Relevant federal and state agencies would be contacted and allowed to review the proposed work plan for the remedial action prior to implementation of any action that may impact the river.	Relevant and Appropriate

ARARS AND TBCS ASSOCIATED WITH ALTERNATIVE RDA-5: EXCAVATION AND OFFSITE DISPOSAL OF PCB MATERIAL, AND PERMEABLE SOIL CAP FOR LANDFILL MATERIAL (CONTINUED)
RDA
NAS SOUTH WEYMOUTH, MASSACHUSETTS

Media	Requirement	Requirement Synopsis	Action to be Taken to Attain Requirement	Status
State – Location Specific				
Wetlands	MA Wetland Protection Regulations 310 CMR 10.00	These regulations govern activities in freshwater wetlands, 100-year floodplains, and 100-foot buffer zones beyond such areas. Regulated activities include certain types of construction and excavation activities. Performance standards are provided and include evaluating the acceptability of various activities. The MA Wetland Protection program also is used to coordinate with the *Massachusetts Natural Heritage and Endangered Species Program* regarding the presence of rare wetlands wildlife, such as the spotted turtle (state-listed species of special concern). If a proposed project is determined to alter a resource area which is part of the habitat of a state-listed species, MAWPA regulations (310 CMR 10.59) state that this project "shall not be permitted to have any short or long term adverse effects on the habitat of the local population of this species."	Because remedial activities may include construction in wetlands, they would be performed in compliance with the performance standards of these requirements. Any disturbance of a wetland would be restored.	Applicable
Endangered Species	MA Endangered Species Act (MESA) 321 CMR 10.00	These regulations prohibit the "taking" of any rare plants or animals listed as Endangered, Threatened, or Special Concern by the MA Division of Fisheries & Wildlife. Northern harrier, which is a threatened species, have been observed in the vicinity of the site. They also protect designated "significant habitats." "Significant habitat" can be designated for Endangered or Threatened species populations after a public hearing process.	Environmental surveys would be performed to identify habitats and evidence of endangered species. Precautions to prevent impacts to identified habitats and species would be imposed during site activities.	Applicable

ARARS AND TBCS ASSOCIATED WITH ALTERNATIVE RDA-5: EXCAVATION AND OFFSITE DISPOSAL OF PCB MATERIAL, AND PERMEABLE SOIL CAP FOR LANDFILL MATERIAL (CONTINUED)
RDA
NAS SOUTH WEYMOUTH, MASSACHUSETTS

Media	Requirement	Requirement Synopsis	Action to be Taken to Attain Requirement	Status
Federal – Action-Specific				
Landfill	Presumptive Remedy for CERCLA Municipal Landfill Sites PB93-963339, September 1993	Guidance for complying with federal and state closure requirements, including cover material options and other site controls.	Because landfill capping would be implemented, this TBC would be achieved.	To Be Considered
Landfill	Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills PB96-963314, December 1996	Guidance for applying the municipal landfill presumptive remedy guidance (PB93-963339) to military bases where domestic, industrial, and other types of wastes may have been disposed of in a designated area or landfill.	Because landfill capping would be implemented, this TBC would be achieved.	To Be Considered
Waste	RCRA Identification and Listing of Hazardous Waste, Toxicity Characteristic 40 CFR Part 261.24	These requirements identify the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test set out in Appendix II of 40 CFR Part 61 is referred to as the Toxicity Characteristic Leaching Procedure (TCLP).	Because this alternative involves the offsite disposal of PCB-impacted material and landfill material, it would be analyzed by the TCLP to determine whether they are characteristic hazardous waste under RCRA. Wastes that are determined to exceed TCLP allowable concentrations (and therefore be hazardous), would be disposed offsite in a RCRA Subtitle C or state-equivalent TSDF. Wastes that are determined to be below TCLP allowable concentrations (and therefore nonhazardous), would be disposed offsite in a RCRA Subtitle D or state-equivalent TSDF.	Applicable
Waste	RCRA Standards Applicable to Generators of Hazardous Waste 40 CFR Part 262	Massachusetts has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations. The relevant and appropriate provisions of 40 CFR Part 262 are incorporated by reference. Refer to 310 CMR 30.000.	Because this alternative involves the offsite disposal of PCB-impacted material and landfill material, it would be handled in compliance with the substantive requirements of these standards.	Applicable

ARARS AND TBCS ASSOCIATED WITH ALTERNATIVE RDA-5: EXCAVATION AND OFFSITE DISPOSAL OF PCB MATERIAL, AND PERMEABLE SOIL CAP FOR LANDFILL MATERIAL (CONTINUED)
RDA
NAS SOUTH WEYMOUTH, MASSACHUSETTS

Media	Requirement	Requirement Synopsis	Action to be Taken to Attain Requirement	Status
Waste	RCRA Use and Management of Containers 40 CFR Part 264 Subpart I	These requirements set standards for the storage of hazardous wastes in containers. Refer to 310 CMR 30.000.	Since some of the excavated material may be stored in drums prior to offsite disposal, the substantive requirements of this regulation would be achieved.	Applicable
Waste	EPA OSWER Publication 9345.3 – 03 FS January 1992	Management of wastes generated during remedial activities must ensure protection of human health and the environment.	Waste Management would be in accordance with this guidance.	To Be Considered
Surface Water	Federal Ambient Water Quality Criteria (AWQC) 33 USC 1314(a); 40 CFR Part 122.44	Federal AWQCs include (1) criteria for protection of human health from toxic properties of contaminants ingested through drinking water and aquatic organisms, and (2) criteria for protection of aquatic life.	Contaminant concentrations in Old Swamp River and the associated wetlands would be measured during monitoring to determine whether water quality is being impacted by site activities, and to ensure that AWQCs are being met.	Relevant and Appropriate
State- Action-Specific				
Landfill	MA Solid Waste Management Landfill Final Cover Systems 310 CMR 19.112	These are requirements for landfill final cover systems, including the performance standards and design criteria for cover system components.	This remedial alternative would meet the design and performance standards and include the cover system components outlined in these requirements.	Applicable
Landfill	MA Solid Waste Management Storm Water Controls 310 CMR 19.115	These are requirements for storm water controls based on performance standards and design criteria.	This remedial alternative would meet the design and performance standards of these requirements.	Applicable
Landfill	MA Solid Waste Management Environmental Monitoring Requirements 310 CMR 19.132	These are regulations for surface water and groundwater monitoring, including frequency, quality, reporting, analytical parameters, and mitigation protocols. Also includes leak detection, and supplemental systems (e.g., gas and leachate control) as necessary.	This alternative includes long-term monitoring. Gas and leachate control are not considered practical since the refuse is located within the saturated zone. This remedial alternative would meet the surface and ground water monitoring requirements of these regulations.	Applicable
Landfill	MA Solid Waste Management Landfill Closure Requirements 310 CMR 19.140	These are regulations related to the closure of landfills.	This remedial alternative would meet the substantive closure requirements of these regulations.	Applicable

ARARS AND TBCS ASSOCIATED WITH ALTERNATIVE RDA-5: EXCAVATION AND OFFSITE DISPOSAL OF PCB MATERIAL, AND PERMEABLE SOIL CAP FOR LANDFILL MATERIAL (CONTINUED)
RDA
NAS SOUTH WEYMOUTH, MASSACHUSETTS

Media	Requirement	Requirement Synopsis	Action to be Taken to Attain Requirement	Status
Landfill	MA Solid Waste Management Landfill Post-Closure Requirements 310 CMR 19.142	These are regulations for site maintenance and monitoring during the post-closure period to ensure the integrity of the closure measure as well as to detect and prevent any adverse affects to human health and the environment.	This remedial alternative would meet the substantive post-closure requirements of these regulations.	Applicable
Surface Water	MA Surface Water Quality Standards 314 CMR 4.00	These regulations limit or prohibit discharges of pollutants to surface waters to ensure that the surface water quality standards of the receiving waters are protected and maintained or attained.	Contaminant concentrations in Old Swamp River and the associated wetlands would be measured during monitoring to determine whether or not water quality is being impacted site activities, and to ensure that state water quality standards are being met.	Relevant and Appropriate
Water	MA Standards for Analytical Data for Remedial Response Action Bureau of Waste Site Cleanup Policy 300-89	This policy describes the minimum standards for analytical data submitted to the MADEP.	Because this remedial action includes a long-term monitoring, the analytical methods provided in this policy would be considered.	To Be Considered
Waste	MA Hazardous Waste Regulations 310 CMR 30.000	These regulations contain requirements for the generation, storage, collection, transport, treatment, disposal, use, reuse and recycling of hazardous waste.	Wastes generated as a part of a remedial action for the RDA that are considered hazardous would be handled in compliance with the substantive requirements of these regulations.	Applicable
Waste	MA Hazardous Waste Management Rules (HWMR) Requirements for Generators 310 CMR 30.300	These regulations contain requirements for generators of hazardous waste. The regulations apply to generators of sampling waste and also apply to the accumulation of waste prior to offsite disposal.	Wastes generated as a part of a remedial action for the RDA that are considered hazardous would be handled in compliance with the substantive requirements of these regulations.	Applicable

ARARS AND TBCS ASSOCIATED WITH ALTERNATIVE RDA-5: EXCAVATION AND OFFSITE DISPOSAL OF PCB MATERIAL, AND PERMEABLE SOIL CAP FOR LANDFILL MATERIAL (CONTINUED)

RDA

NAS SOUTH WEYMOUTH, MASSACHUSETTS

Media	Requirement	Requirement Synopsis	Action to be Taken to Attain Requirement	Status
Air	MA Air Pollution Control Regulations 310 CMR 7.09	These regulations establish the standards and requirements for air pollution control in the commonwealth. Section 7.09 contains requirements relevant to dust, odor, construction and demolition.	Any emissions of fugitive dust will be managed through engineering and other controls during remedial activities.	Applicable
Water	MA HWMR Groundwater Protection 310 CMR 30.660 – 30.679	These regulations require groundwater monitoring at specified regulated units that treat, store, or dispose of hazardous waste. Maximum concentration limits for the hazardous constituents are specified in 310 CMR 30.668.	The remedial action for the site would include groundwater monitoring. If wastes generated as part of a remedial action for the RDA are determined to be hazardous, the monitoring program would be developed to comply with the substantive sections of these requirements.	Applicable

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

March 11, 2009

Brian J. Helland, P.E.
BRAC Program Management Office NE
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Five-Year Review Report

Dear Mr. Helland:

Thank you for the opportunity to review the first *Five-Year Review Report* dated January 2009. Overall, EPA believes that the text of the Five-Year Review warrants significant revision. Given that Section 2.7 correctly identifies numerous issues related to inadequacies in the protectiveness of the Rubble Disposal Area ("RDA") remedy, it is surprising to EPA that the Five-Year Review concludes that the remedy for the RDA is expected to be protective. Nothing beyond additional monitoring is proposed to ameliorate the high concentrations of manganese exhibited in the RDA groundwater. EPA believes that the protectiveness statement in the Five-Year Review for the RDA remedy should be changed. Specifically, EPA believes that the Five-Year Review should reveal that RDA remedy is not protective over the long-term. This is primarily because a Grant of Environmental Restrictions ("GER") is not yet in place (to establish a proper compliance boundary) and an Explanation of Significant Differences ("ESD") needs to be prepared as recommended by EPA in its September 3, 2008 letter. Detailed comments are provided in Attachment A.

EPA believes that the GER is essential to properly implement the institutional controls required by the 2003 ROD and to address the concerns of trespassing raised through community interviews (*see* Appendix C of the Five-Year Review). While EPA recognizes that the GER cannot be recorded until a deed is recorded, it is unclear why so little progress has been made on this front in over five years.

As stated above, EPA maintains that an ESD is necessary to correct deficiencies in the 2003 RDA ROD. Pursuant to Section 19.2 of the FFA, EPA believes that "...additional action or modification..." of the RDA administrative record is required. Moreover, pursuant to Section 9.15(B)(2) of the FFA, a supplemental response action is required to address the high concentrations of manganese in the groundwater. A compliance boundary is necessary to clearly define the point of compliance for the remedy. Also the remedial goals, including federal or more stringent drinking water standards, are necessary to determine whether the remedy is functioning as intended. Since these standards and goals are used as measurements of success for the remedy, EPA presented them as action-specific ARARs. EPA notes that these standards are identified in Sections 8 and 12 of the ROD, but not accurately carried forward to the ARARs tables.

EPA is puzzled that the Navy continues to believe that EPA has recommended that the groundwater at the RDA site requires treatment when EPA has never expressed this. In fact, EPA has tried to correct errors in the existing RDA ROD that are now complicating the findings of this Five-Year Review. Pages 56 and 57 of the 2003 RDA ROD establish cleanup levels for groundwater. Since the ROD states that "...long-term monitoring of groundwater and surface water ... allow for continued assessment of the adequacy, reliability, and long-term effectiveness...," EPA purposely provided action-specific ARARs, not chemical-specific ARARs, in its September 3, 2008 letter. Without an ESD, EPA must enforce the requirements of the 2003 ROD. Accordingly, the remedy is not meeting the requirements of the 2003 ROD and additional administrative action is required.

Secondly, EPA maintains that the remedy is not protective in the long-termuntil institutional controls are in place. EPA remains waiting for a response to our letter dated January 14, 2009 on the GERE language and questions whether any discussions have occurred to further its completion.

Manganese remains widespread and highly elevated, showing exceedances of the remedial goal (0.313 mg/L) at almost all monitoring wells and in all rounds. Maximum detected manganese in the review period is 23.3 mg/L (total, at TT04, April 2008). It should be noted that the cap apparently is not mediating groundwater manganese concentrations, which were detected at concentrations higher than any detection during the RI (maximum 14.1 mg/L).

The descriptive text concerning the RDA site history and remediation fails to mention the discovery of petroleum hydrocarbon contamination during excavation. This should be mentioned in the interest of completeness and objectivity. For example, on page 2-4, §2.2.3, it is stated that, "Materials observed at the site during environmental investigations included glass, insulation material...." This list should include mention of petroleum hydrocarbons (*e.g.*, sheen on standing water). The presence of hydrocarbon residuals is significant, because it may influence redox conditions in the subsurface, in turn influencing the mobility of metals, including manganese.

Please tabulate the field parameters collected in conjunction with sampling of groundwater and surface water, and include these data with the analytical data tables (*e.g.*, Tables 2-5, 2-6, 2-9, 2-10). These data contain essential information (*e.g.*, DO, ORP, turbidity) for the interpretation of the analytical results for inorganics. It is important to know whether any of the analytical results are influenced by turbidity, and to observe the redox indicators associated with elevated manganese.

The document recommends (page 2-43, §2.6.2), "... that the monitoring of surface water and sediment quality be continued and if increasing trends are observed, the need to re-evaluate the risks assessment be considered." EPA agrees that monitoring of surface water and sediment should be continued.

Toward the end of Section 2.6.2, monitoring of surface water and sediment quality is recommended. If increasing trends are observed, the need to re-evaluate the risk assessment will be considered. In order to facilitate the review of such trends and readily evaluate their risks, please provide tables of sediment and surface water data that show the 2007 and 2008 concentrations for each chemical next to each other, by station. These "trend tables" should also have a risk-based benchmark for each

chemical so that risk can be evaluated. National Recommended Water Quality Criteria should be used for surface water data. Sediment benchmarks should be those from the RI ecological risk assessment or, preferably, the Probable Effect Concentrations (PECs) from MacDonald *et al.* (2000) (MacDonald, D.D., *et al.* 2000. *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems.* Arch. Environ. Contam. Toxicol. 39, 20-31). Please discuss whether there are any discernible trends between 2007 and 2008 in the concentrations of chemicals in surface water and sediment. Although there are no sediment cleanup levels or remedial goals specified in the ROD, comparison of sediment concentrations with the risk-based benchmarks used in the RI or the PECs is needed if the concentrations are found to increase over time in order to ensure that the original risk conclusions remain valid. Sediment samples will have to be taken and analyzed in the future in order to determine whether there is a risk. Therefore, sediment sampling should be added to the second item in the table in Section 2.8 (*i.e.*, "Continue to monitor concentration trends in groundwater and surface water *and sediment*" – emphasis added).

I look forward working with you and the Massachusetts Department of Environmental Protection on the investigation and remediation of the remaining areas of the base. Please do not hesitate to contact me at (617) 918-1385 should you have any questions or wish to arrange a meeting.

Sincerely,

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Dave Barney, USN, South Weymouth, MA
Dave Chaffin, MADEP, Boston, MA
Kevin Donovan, SSTTDC, South Weymouth, MA
Monica McEaddy, USEPA, Washington, DC
Rona Gregory, USEPA, Boston, MA
Bryan Olson, USEPA, Boston, MA
Phoebe Call, TTNUS, Wilmington, MA

ATTACHMENT A

Page	Comment
p. 2-10, §2.3.2	The section titled "Turtle Bridges" states, "... a ¾-inch layer of crushed stone was placed ...." Should this instead read, "... a layer of ¾-inch crushed stone was placed ...?"
p. 2-12, §2.3.3	The seventh bullet indicates that there will be monitoring for cap settlement once per year for the 30-year post-closure period. Please clarify that this requirement applies to Massachusetts regulation, not CERCLA. The subsequent sentence indicates that O&M, or post-closure care, must be performed for 30 years after the landfill closure. Please clarify after this sentence that Five Year Review reports will be required.
p. 2-18, §2.5.4.1	Under "Groundwater Sampling," it is mentioned that a groundwater recharge issue at the background monitoring wells was identified. Since Section 2.8 indicates that the background wells will be replaced, please also mention this here to explain how the issue will be resolved.
p. 2-23, §2.5.4.1	Sediment Monitoring: The text observes, "There are no sediment cleanup levels or remedial goals specified in the ROD." Despite this, it would be useful to provide baseline values for key potential contaminants for comparison to the monitoring results. For example, sampling and analysis for manganese in sediment is included in the LTM program in order to monitor for potential accumulation of manganese in sediment from discharging groundwater. Therefore, possible increases in sediment manganese over relatively long time scales are of particular interest. For this reason, it would be useful to provide reference values for comparison to the LTM data. For example, the Phase II RI (2001) found manganese in sediment ranging from 170 to 1280 mg/kg (eight samples). The 2007 sampling summarized here found manganese from 421 to 2160 mg/kg; in 2008 the reported range is 455 to 2610 mg/kg (n = 4).
p. 2-24, §2.5.4.1	The text briefly discusses some apparent anomalies for metals in sediment (Be, Se, Ag, Tl), which is informative. Because manganese is of particular concern for the site, the text should describe the manganese results for the period under review.
p. 2-32, §2.6.1	The text refers to Figure 2-6 for a depiction of arsenic concentrations over the review period. Please indicate whether the results shown are for unfiltered (total) or filtered (dissolved) arsenic. The apparent "spike" in arsenic concentrations seen at several wells in the September 2007 sampling round is evident in both the filtered and unfiltered samples, so it is apparently not

because of turbidity (*e.g.*, Table 2-18). These observations highlight the need to tabulate the field parameters along with the presentation of the analytical data.

p. 2-36, §2.6.1 — Under "Wetland Inspections," it is mentioned that glyphosate or another suitable post-emergence herbicide, if approved, is recommended. Please describe the status of this approval and what else is needed to ensure that treatment is conducted.

p. 2-37, §2.6.1 — EPA agrees that pesticides and herbicides do not appear to be a significant issue with respect to groundwater at the site, and their elimination from the monitoring program is justified. However, groundwater should continue to be monitored for PCBs to verify the effectiveness of the remedy because PCBs were primary drivers for the remedial action at the site.

p. 2-38, §2.6.2 — As stated earlier, EPA does not believe that the remedy is protective in the long-term until the institutional controls are implemented. This page states that "...The Navy expects the plan [Land Use Control Remedial Design Plan] will be implemented upon transfer of the property to the developer...." As you know, the property transfer has been delayed at least six months. Please explain how the Navy will implement institutional controls if the developer's project fails and the transfers do not take place.

At the end of "Changes in Exposure Pathways," it is asserted that the new source approval process would prevent new wells from being sited in the vicinity of the landfill or adjacent wetlands because the proponent would have to identify any potential hazards within the proposed Zone 2. Is it possible for a proponent to identify a hazard (*e.g.*, landfill) within the Zone 2, and demonstrate with modeling results or pump tests that the proposed wells and production pumping rates would not draw contaminated groundwater from that hazard? Please address.

p. 2-39, §2.6.2 — This section should discuss the changes to the ARARs since the RODs were issued and explain how any changes affect the remedy. The ARARs for the Rubble Disposal Area include MA Solid Waste Management Environmental Monitoring Requirements, 310 CMR 19.132. These regulations changed in 2005 to add language regarding the groundwater point of compliance for solid waste landfills. Since the ROD was issued before 2005, the language regarding a point of compliance was not addressed in the ARARs in the ROD. Yet, there is a statement in the fourth paragraph on page 2-39 of the Five-Year Review that erroneously states that "...No changes were identified to the Massachusetts Solid Waste Management Requirements or the Massachusetts Surface Water Quality Standards...." The Five-Year Review must mention the change to the Solid Waste Management Requirements that

was made in 2005. It is particularly important because the need to delineate a compliance boundary is part of the reasoning supporting EPA's decision that an ESD be issued to add MCLs as action-specific ARARs for monitoring purposes. As noted earlier, EPA believes that an ESD is necessary and other ARARs need to be included in this discussion and as part of Appendix E.

p. 2-40, §2.6.2 — The text regarding the need for an ESD is not correct and is inconsistent with other RODs for remedies consisting of institutional controls and monitoring requirements. In the previously-issued RODs, landfills are considered waste management areas where groundwater cleanup levels will not be achieved. In such an instance, MCL/groundwater standards are performance-based standards guiding the monitoring program and the standards are used to ensure that the groundwater achieves the drinking water standard outside the compliance boundary for the waste management area. Therefore, it is EPA's position that the chemical-specific TBC ARARs are necessary to identify the risk and the MCLs and state groundwater regulations are necessary as action-specific standards guiding the monitoring program and the location of the compliance boundary for the waste management area.

Under "Changes in Toxicity and Other Contaminants Characteristics," the new EPA regional risk screening levels are identified as the "new Oak Ridge National Laboratory (ORNL) screening levels." Please name these tables "EPA regional risk screening levels."

§2.8 — It is unclear how monitoring the groundwater will be protective in the future. EPA recommends changing the second "No" to "Yes" for future protectiveness. The 2003 ROD appears to establish the toe of the landfill as the compliance boundary (Figure 6 of the ROD). As you know, EPA recommended that the Navy consider expanding the compliance zone in its September 3, 2008 letter, but the Navy has elected to take issue with this recommendation. Without an appropriate compliance boundary for the site, the site monitoring data currently reveal that the remedy is not performing as intended by the 2003 ROD.

While the lack of implemented land use controls does not affect current protectiveness, it does affect future protectiveness because future land use controls are not certain. This lack of future protectiveness should be reflected in the table, by changing the second "No" to "Yes." Please explain why the Navy is not proceeding with implementation of land use controls by deed restriction.

§3.0 — Please add the Main Gate Encroachment Area.

p. 3-2, §3.1.1 — The schedule for the pre-design investigation, and subsequent activities

should be updated.

§3.1.1, ¶3 — The text here is not correct. While the PDI is underway, EPA has received extremely limited information with respect to the remedial design and cannot currently discern whether the cap that will be constructed will meet the intent of the September 2007 ROD. This is particularly troubling because on-site construction has already begun. EPA expects the Navy to prepare remedial design documents and submit them for regulatory approval soon.

p. 3-4, §3.1.3 — Please indicate the time-table for completion of the remedial design and the implementation of the remedial action.

p. 3-5, §3.1.4 — Please change the wording to, "The highest concentrations of VOCs are present in the deep overburden and shallow bedrock zones, and the known lateral extent of the plume is the greatest in these zones."

p. 3-5, §3.1.4 — What is an approximate time-table for completion of the remedial investigation, and subsequent milestones? The text should discuss additional evaluation of vapor intrusion necessary to more completely evaluate the site (*e.g.,* future residents, *etc.*).

p. 3-6, §3.1.5 — What was the outcome of the 2003 due diligence site assessment? When was a report completed? Please explain the chronology and progression of events that led from the due diligence site assessment phase to the RI Work Plan. When was the RI work plan finalized? It is also noted, that while "field activities were completed in December 2006," for that phase of work, additional characterization work is planned in the near future. For example, a document entitled, *Remedial Investigation Work Plan Addendum for Building 82 (IR-10), Weymouth Naval Air Station South Weymouth, Weymouth, Massachusetts, January 2009*, outlines specific additional characterization actions to be taken to better understand potential groundwater contamination in the up-gradient portion of the Building 82 site.

p. 3-7, §3.1.6 — Based on EPA's review of the RI, additional characterization phase(s) is needed to finalize the RI for the SRA.

p. 3-9, §3.1.9 — The EE/CA for AOC 55C needs to include a post-remedial monitoring phase, including groundwater monitoring.

p. 3-11, §3.2.1 — During the test pitting, EPA observed free-phase oil and petroleum odor. To describe the material as "associated with existing asphalt" is misleading, particularly given the magnitude of the soil removals that were completed under the MCP. Please include the volumes of soil removed.

Table 2-9	This table shows exceedance of the NRWQC for alkalinity (20 mg/l). Please check and revise if necessary.
Table 2-14	Please add the sediment results for Aroclors in 2008.
Table 2-16	Please correct the concentration units for lipids and PCB homologs in mammal tissue.
Table 2-18	Please note that the entry for total arsenic at TT-07 in March 2007 should be bolded.
Figure 1-1	Please show the location of the RDA on this map.
Figure 2-5	To facilitate interpretation, please add a note to reveal that MW05 and TT01 are upgradient/background wells.
Figures 2-7 & 2-8	Please indicate the Lower Explosive Level and Upper Explosive Level for methane to clarify which concentrations are potentially explosive. Consider also adding oxygen concentrations to these figures for the same reason.
Appendix E	Please update these tables with the ARARs tables provided to the Navy in EPA's September 3, 2008 letter.